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THE NORTON UTILITIES® FOR MACINTOSH

The Essential Solution for Data Recovery, Protection, and Backup

Version 2.0

Using the Norton Utilities for Macintosh

SYMANTEC

THE NORTON UTILITIES FOR MACINTOSH

User's Guide & Reference

Norton Utilities for Macintosh

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Introduction

About This Manual

This *User's Guide and Reference* manual has three main parts. The first part is the *User's Guide*. The Guide contains illustrated, step-by-step procedures for recovering lost or deleted documents, applications, and other files; for repairing damaged disks, for speeding up day-to-day operations, customizing operations, and more.

Chapter 1 of the *User's Guide* contains a list of problems and their symptoms. Each problem refers to a procedure to solve the problem. There are procedures for critical operations, for day-to-day operations, and for security operations. Chapter 2 contains procedures for using Norton Disk Doctor, Volume Recover, UnErase, and other utilities to repair problems and recover data. Chapters 3, 4, 5, and 6 contain a wide range of procedures to improve your computing efficiency, security, and speed.

The second part of the manual is the *Reference*. This contains detailed information about all features and functions of the Norton Utilities for Macintosh.

The third part of the manual is the *Norton Disk Companion for Macintosh*, which provides inside information on the structure and workings of Macintosh disks.

The last part of the manual includes the Appendices. The Appendices contain general information about the Norton Utilities, further advice on troubleshooting, and a list of common error messages. The Appendices are followed by the glossary and index. If you're not sure about the meaning of a term, please be sure to check the glossary.

For information on contacting our Technical Support Service Staff, refer to the Customer Service Plan in the back of this manual.

Emergency Information

If you purchased Norton Utilities to recover data from your hard disk go directly to "Start Here."

If your Macintosh is fine and you wish to install the Utilities

If you have no deleted files to recover and no damage to repair, you can install the Utilities with confidence. Go to "Installation," next. This applies to first-time buyers of the Norton Utilities for Macintosh, as well as those of you who are upgrading from previous versions of the Norton Utilities or the Symantec Utilities for the Macintosh.

For a general description of Norton Utilities for Macintosh

For a general description of Norton Utilities for Macintosh, and to read about what's new in this version, see Appendix A, "About Norton Utilities for Macintosh."

Start Here

If you wish to recover data from your startup hard disk

Before you attempt a repair or recovery be sure to do the following:

- **Locate the Emergency Disk.**
  There is one Emergency Disk specially designed for use on your system. You will startup your Macintosh from this disk for emergency repairs.

- **Don't install the Norton Utilities for Macintosh on a disk that you want to repair or recover data from.**
  In fact, *any* new information saved to your disk might destroy the files you are trying to recover. Use the Emergency Disk.

- **Don't initialize your disk.**
  Many disk problems cause a warning to be displayed that ends with this question: "Do you want to initialize the disk?". Click No. There is a good chance the disk can be repaired or the data can be recovered. If a disk is initialized, it greatly reduces the chances of recovery.

- **Use this manual.**
  It can make repair and recovery easier and less frustrating. Turn to Chapter 1, "Diagnosing Problems," to find out which procedure to follow next.

- **Relax.**
  Take a deep breath and roll up your sleeves, for you are in good hands. Most Macintosh disk-related problems are a snap for the award-winning Norton Utilities for Macintosh.

Installing Norton Utilities for Macintosh

Use the Norton Installer, located on the Norton Installation disk, to copy all the Norton Utilities files to your hard disk. If you choose, the Norton Installer also activates FileSaver protection for your disks, thus providing extra protection for your data. In addition, you can have the Norton Installer create Volume Information Files (VIFs) for all your mounted disks (a mounted disk is one whose icon is visible on the desktop). These VIFs can really come in handy in the event of a catastrophic failure.

If your disk is damaged or has erased files, start your Macintosh with the one of the Norton Emergency Disks, and run Norton Utilities from there. See Chapter 2, "Disk Repair and File Recovery," for more information.

FLOPPY-ONLY SYSTEMS
Please read the note at the end of this chapter.

Starting Installation

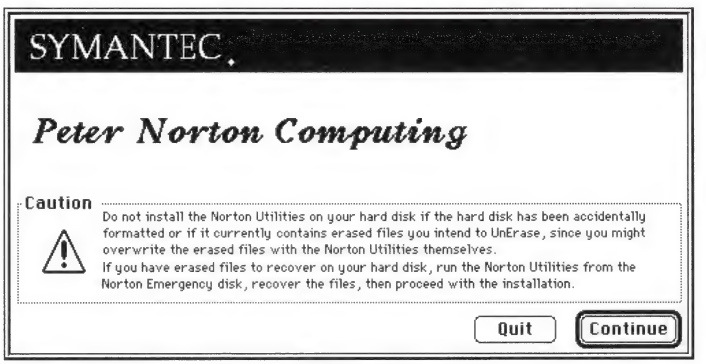
Start with your Macintosh turned on.

› **To begin installation:**

1 Insert the Installation Disk into an available floppy drive.
The disk's window opens, showing the file icons on the Installation disk.

2 Double-click the Norton Installer icon.
The Norton Installer starts and a warning dialog box appears. This dialog box reminds you that you should not install the Norton Utilities if your hard drive has suffered damage that you wish to repair, or if it contains lost files that you want to recover. By installing the Norton Utilities, you could permanently erase the very files you wish to recover.

Figure IN-1
The Norton Installer Warning dialog box

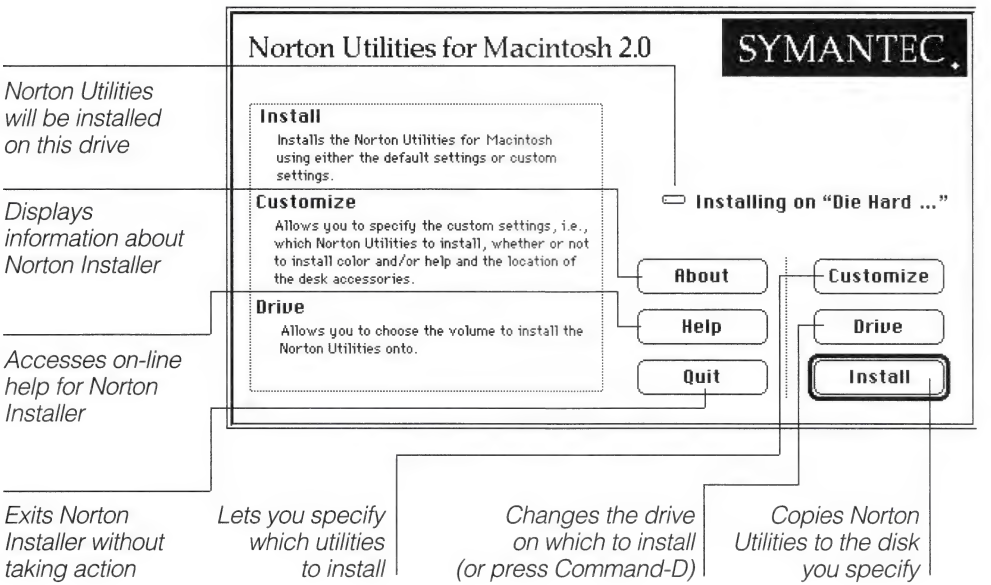

SYMANTEC.
Peter Norton Computing
Caution
Do not install the Norton Utilities on your hard disk if the hard disk has been accidentally formatted or if it currently contains erased files you intend to UnErase, since you might overwrite the erased files with the Norton Utilities themselves.
If you have erased files to recover on your hard disk, run the Norton Utilities from the Norton Emergency disk, recover the files, then proceed with the installation.
Quit
Continue

3 To stop installing, click Quit.

OR

To go on with installation, click Continue.
The Norton Installer window appears. The legend at the left of the window explains the more important buttons to the right.

Figure IN-2
The Norton Installer window


Norton Utilities for Macintosh 2.0
SYMANTEC.
Install
Installs the Norton Utilities for Macintosh using either the default settings or custom settings.
Customize
Allows you to specify the custom settings, i.e., which Norton Utilities to install, whether or not to install color and/or help and the location of the desk accessories.
Drive
Allows you to choose the volume to install the Norton Utilities onto.
Installing on "Die Hard ..."
About
Help
Quit
Customize
Drive
Install
Norton Utilities will be installed on this drive
Displays information about Norton Installer
Accesses on-line help for Norton Installer
Exits Norton Installer without taking action
Lets you specify which utilities to install
Changes the drive on which to install (or press Command-D)
Copies Norton Utilities to the disk you specify

4 To continue with automatic installation of all the Norton Utilities, click Install.
Norton Installer proceeds with automatic installation of all utilities.

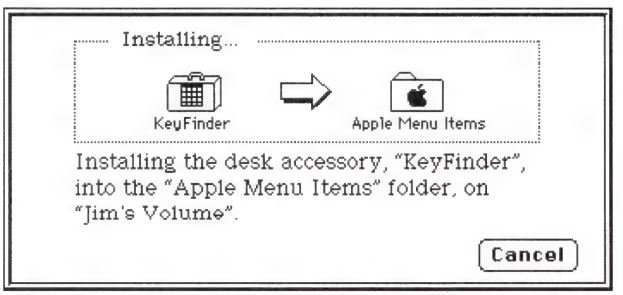
Under System 6, the installer first determines if you have any resource utility, such as Suitcase II, active. If so, a dialog box appears asking you where you wish to install desk accessories. You can choose to install the desk accessories directly into your System file or into a separate folder. If you choose to install into a folder, you're asked to specify which folder and what name to give the desk accessories file.

OR

To omit specific utilities from installation, click Customize.
Customize allows you to choose which utilities to install. For more information skip to the section headed "Customizing Installation" at the end of this chapter.

5 Follow the prompts to insert Norton Application disks during installation.
The Progress dialog box keeps you informed about what is being installed and where it's going. Click Cancel at any time to stop installation.

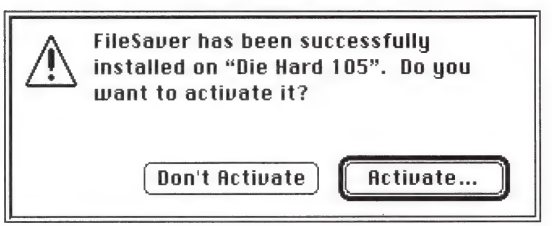
Figure IN-3
The Norton Installer Progress dialog box


Installing...
KeyFinder
Apple Menu Items
Installing the desk accessory, "KeyFinder", into the "Apple Menu Items" folder, on "Jim's Volume".
Cancel

If Norton Installer finds outdated copies of any Norton Utilities, you'll be asked if you want to replace or update them.

- **Click Update to have the Norton Installer replace that one file.**
- **Click Update All if you want all outdated files replaced without having the Norton Installer bother you about it again.**
- **Click Don't Replace to skip the one file.**

Near the end of the installation process there's still some housekeeping to be done. You're asked if you want to activate FileSaver protection.

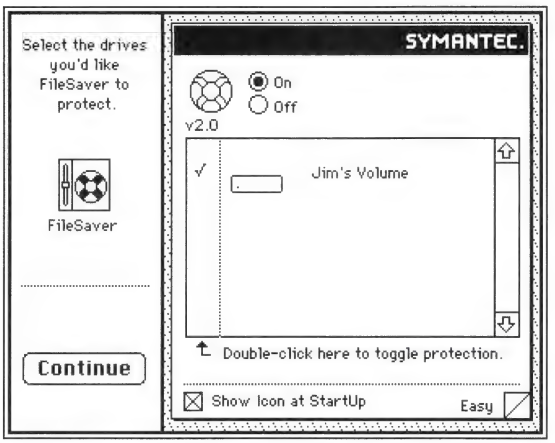


FileSaver is a very important part of the Norton Utilities for Macintosh and it is strongly recommended that you install and activate it.

› **To activate FileSaver protection:**

6 Click Activate... if you want to proceed with FileSaver protection. Click Don't Activate to skip to the next step.
The FileSaver control panel appears.

Figure IN-4
The FileSaver control panel

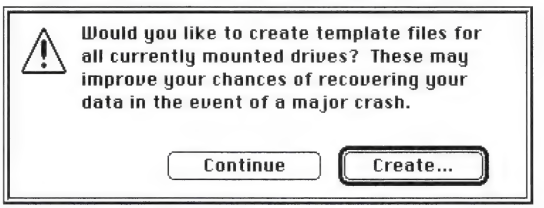


7 To start FileSaver, double-click to the left of each drive you want to protect and click the ON button.
FileSaver puts a checkmark beside each drive you've selected. You see a confirmation of which drives you've selected for protection.

For more details on configuring FileSaver with the Expert layer, see the Filesaver section of the *Reference*.

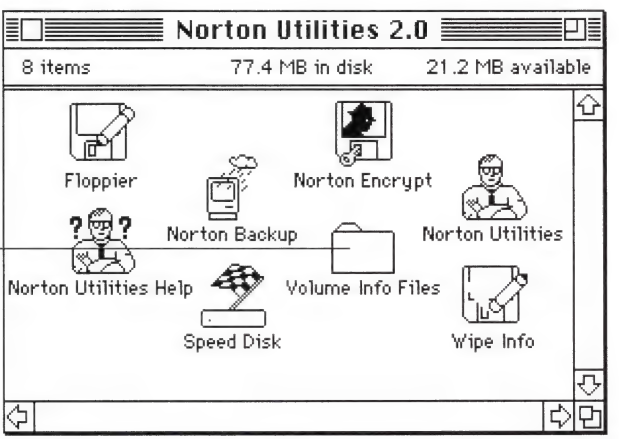
When you activate FileSaver, it may ask if you want to update any older files created by SUM Shield and Norton Utilities for Macintosh. You can choose to update or continue without updating. If you don't update, FileSaver will ignore the older files.

8 Click Continue.
Next, the Norton Installer asks if you want to create Volume Information Files for all your mounted disks. Again, these can be lifesavers in the event of a truly major disk crash.


Would you like to create template files for all currently mounted drives? These may improve your chances of recovering your data in the event of a major crash.
Continue
Create...

9 To create Volume Information template files, click Create.... To skip, click Continue.

A separate file for each disk will be stored in a VIF folder within the Norton Utilities 2.0 folder. It's a good idea to copy your VIF folder on to a separate disk to be safe.



Volume Information Files folder

At the end, the Norton Installer presents a summary installation report, telling you what was installed where.

10 You're finished! Click Restart.

Your Macintosh restarts with all the Norton Utilities desk accessories and startup documents active.

OR

Click Quit.

You leave the Norton Installer without restarting your Macintosh. Some startup documents will not become active until you restart.

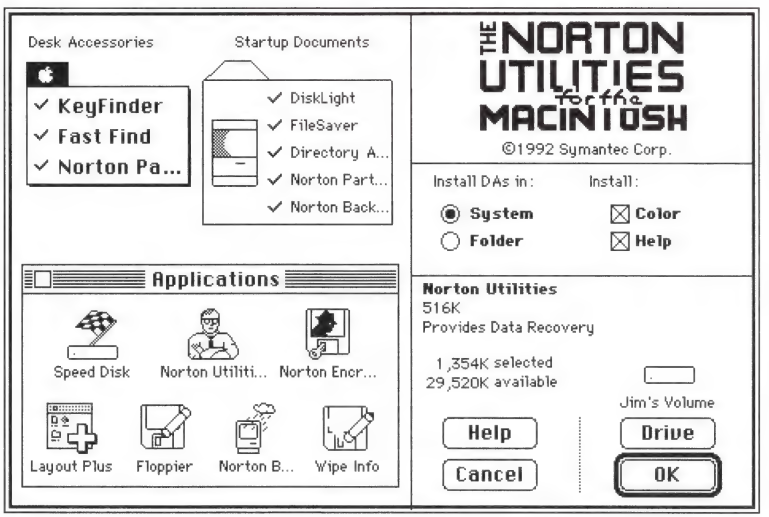
Skip to "Next Steps" at the end of this chapter.

Customizing Installation

When you click Customize on the Norton Installer window, you see a dialog box that allows you to choose which utilities to install.

Figure IN-5

The Norton Installer Customize dialog box



The startup documents and desk accessories use more than 200K of system memory. If you're running Norton Utilities on a system with RAM of 2 MB or less, you may wish to omit installing some of the utilities. Follow the instructions below to omit a utility from installation.

The Customize dialog box shows you where all the Norton Utilities will be placed on your hard disk. To the left are three large areas, showing the individual pieces of Norton Utilities to be installed. Selected desk accessories and startup documents are indicated by checkmarks; selected applications are highlighted.

- **To omit an item from installation, click to deselect it.** The desk accessories and startup documents don't have a checkmark if you deselect them. The applications are light when deselected; dark when selected.

You can also specify whether you'd like desk accessories installed in the System file or in a folder. Only users of System 6 who want the Norton Utilities installed directly into the System file should use the System option.

If you're running System 7, Norton Installer will locate each applicable utility in its proper folder within the System folder.

Finally, you can specify whether to install the color icon resources and the on-line help.

- **Click OK when you've made all your choices.** You go back to the Norton Installer window.
- **To continue with the rest of the installation, click Install and follow the previous instructions from Step 5.**

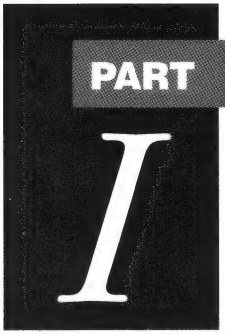
A note about Preference files

Norton Utilities places a Norton Utilities folder in the Preferences folder in your System folder. If you want to update your preference files, just delete the older preference files from your hard disk.

FLOPPY-ONLY SYSTEMS: If you do not have a hard disk drive, use Floppier to create backup copies of the originals and run the Norton Utilities from those working copies. That way, you'll be sure that all the files (including the System and Finder files on the Emergency Disk) are copied.

Next Steps

Once you've installed, you can start making the most of your investment. A good place to start is to run Norton Disk Doctor. See Chapter 2, "Diagnosing Problems" for details. After that, scan through this manual or the on-line help files for more information on using the Norton Utilities to your greatest advantage.



User's Guide

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CHAPTER

1 Diagnosing Problems

Before you can find a solution, you must define the problem. This chapter will help you to determine what is ailing your Macintosh and point you to the right cure.

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How to use this chapter

This chapter describes the typical symptoms that appear when your Macintosh is in trouble. The symptoms are arranged in two groups for easy reference: Startup problems, and Damaged Disks and Files. Each symptom is illustrated and accompanied by a brief description of the associated problems and their solutions. The problems and solutions are listed in order of the likelihood in which they occur.

You may not be interested in why a problem occurs. If so, just look at the Solutions column. Try each solution in the order listed. Keep in mind that some problems can be fixed by using just one procedure while others may require several.

The end of the chapter tells you where you should turn to in this manual to find the step-by-step procedure for each "solution."

Startup problems

Look in this section if your Macintosh cannot complete a normal startup.

Flashing question mark (Missing disk icon)

When you turn on your Macintosh, you see the flashing question mark or "Missing disk" icon because the Macintosh cannot find a startup disk.

Problems	Solutions
Power or data cable for the external startup drive is not connected properly.	Check the power and data cables.
Boot blocks on the startup disk are damaged.	Use Norton Disk Doctor.
Volume Information Block is damaged.	Use Norton Disk Doctor.
Parameter RAM is trashed.	Zap the PRAM.

Problems	Solutions
Device driver for the disk is damaged.	Replace SCSI device driver, then use Norton Disk Doctor.
System or Finder files are damaged or missing.	Replace damaged system files.

"Sad Macintosh" icon

Instead of starting up normally, you see the "Sad Macintosh" icon with a set of hexadecimal numbers appearing underneath the icon. This means that problems were found when the Macintosh was performing self-diagnostics.

- **Macintosh Plus or older:**
  Six digits are displayed. The second digit from the left is an F.
- **Macintosh SE, Macintosh II family, Macintosh Classic family, Powerbooks and Quadras:**
  Two rows of eight digits each are displayed. The last digit on the top row is an F.

  If your "Sad Macintosh" code is different than described above, you may have a hardware problem that only a qualified service technician can repair.

Problems	Solutions
Device driver for the disk is damaged.	Replace SCSI device driver, then use Norton Disk Doctor.
Boot blocks on the startup disk are damaged.	Use Norton Disk Doctor.

Chimes

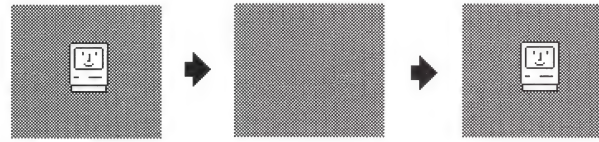
After the startup chord you hear four notes played in succession. The screen is black or displaying the "Sad Macintosh" icon (Macintosh II family only). Also see "Sad Macintosh" icon.

The Macintosh performs self-diagnostics immediately after you turn the power on. If it finds problems which prevent it from continuing, it may play four notes in succession or "chimes" often accompanied by the "Sad Macintosh" icon.

Problems	Solutions
SCSI device conflict or improper termination.	Check for SCSI device conflict or improper termination.
Data cable for the external startup drive is not the correct type.	Make sure that you are using a working SCSI cable.
Boot blocks on the startup disk are damaged.	Use Norton Disk Doctor.
Device driver for the disk is damaged.	Replace SCSI device driver, then use Norton Disk Doctor.

Cycling "Happy Macintosh" icon

At startup the "Happy Macintosh" icon appears, disappears then reappears in a cyclic pattern.

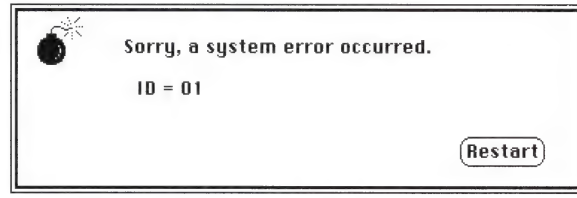


This sometimes happens when you introduce new SCSI devices to your setup.

Problems	Solutions
Boot blocks on the startup disk are damaged.	Use Norton Disk Doctor.
System or Finder files are damaged or missing.	Replace damaged system files.
SCSI device conflict or improper termination.	Check for SCSI device conflict or improper termination.
Parameter RAM is trashed.	Zap the PRAM.

System error or disk "hangs" during startup

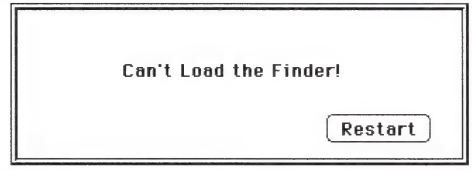
During startup you get a system error or the Macintosh "hangs" before, during, or after the Welcome to Macintosh banner or startup screen.



Problems	Solutions
Boot blocks on the startup disk are damaged.	Use Norton Disk Doctor.
CDEV or System Extension conflict.	Check for init conflict.
System or Finder files are damaged or missing.	Replace damaged system files.
Device driver for the disk is damaged.	Replace SCSI device driver, then use Norton Disk Doctor.

"Can't load the Finder!"

During startup, after the Welcome to Macintosh banner, you get the "Can't load the Finder!" error message.

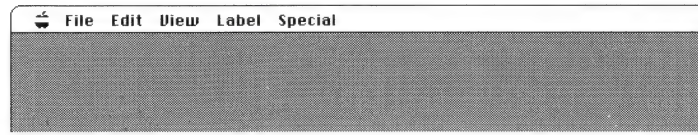


The Macintosh cannot locate critical startup information.

Problem	Solution
Finder files are damaged or missing.	Replace damaged Finder file or, if necessary, System and Finder files.

Disk icon does not appear on desktop

The Macintosh freezes or you get an error message before the disk icon will show on the desktop.



Problems	Solutions
Device driver for the disk is damaged.	Replace SCSI device driver, then use Norton Disk Doctor.
Volume Information Block is damaged.	Use Norton Disk Doctor.
The desktop file is damaged.	Rebuild the desktop file.
Power or data cable for the external startup drive is not connected properly.	Check the power and data cables.
SCSI device improper termination	Check for SCSI device improper termination.
Parameter RAM is trashed.	Zap the PRAM.

Flashing X: Disk ejected

You are trying to start up from a floppy disk and the disk is ejected while the flashing X is displayed.

Problems	Solutions
The disk does not contain a System folder.	Use a disk that you are sure contains the System folder.
Boot blocks on the startup disk are damaged.	Use Norton Disk Doctor.
System or Finder files are damaged.	Replace damaged system files.

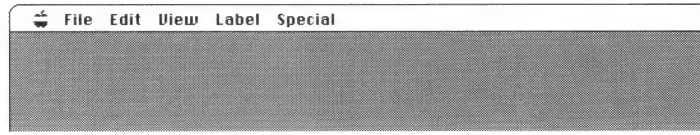
Damaged Disks and Files

Look in this section if you can start up normally, but have problems with the following:

- disk will not mount
- disk cannot be accessed
- system bombs frequently during use
- files will not open
- files cannot be found
- files have disappeared

Disk icon does not appear on desktop

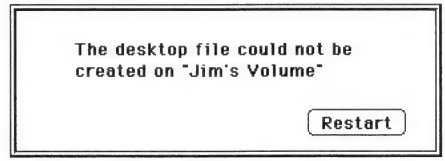
Your disk icon does not appear on the desktop or the Macintosh screen "freezes" preventing access.



Problems	Solutions
Device driver for the disk is damaged.	Replace SCSI device driver, then use Norton Disk Doctor.
Volume Information Block is damaged.	Use Norton Disk Doctor.
The desktop file is damaged.	Rebuild the desktop file.
Power or data cable for the external startup drive is not connected properly.	Check the power and data cables.
SCSI device improper termination.	Check for SCSI device improper termination.

"The desktop file could not be created on <volume name>."

You get this message right before the disk would normally appear on the desktop.



Problems	Solutions
Volume Information Block is damaged.	Use Norton Disk Doctor.
The desktop file is damaged.	Rebuild the desktop file.
Floppy disk is locked.	Unlock the floppy disk and try again.
SCSI device improper termination.	Check for SCSI device improper termination.
Device driver for the disk is damaged.	Replace SCSI device driver, then use Norton Disk Doctor.
Power or data cable for the external startup drive is not connected properly.	Check the power and data cables.

"This disk is damaged: do you want to initialize it?"

One of the following messages appears when you insert a floppy disk or before your hard disk can be mounted to the desktop.

"This disk is unreadable: do you want to initialize it?"

"This is not a Macintosh disk: do you want to initialize it?"

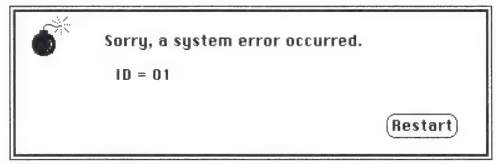
"This disk has been improperly formatted for use in this drive: Do you want to initialize it?"

"This disk is damaged: Do you want to initialize it?"

Problems	Solutions
Volume Information Block is damaged.	Use Norton Disk Doctor.
The logical structure of the disk may be damaged.	Use Norton Disk Doctor.
A high-density (1.44 MB) floppy disk has been inserted into an 800K drive or an 800K floppy disk inserted into a 400K floppy disk drive.	Check the floppy disk for compatibility with your floppy drive. (High-density disks usually are marked with the letters HD by the sliding shield or door.)
The floppy disk drive has a hardware problem.	Try the floppy disk in another drive to see if it is readable. Try to format other floppy disks. If they can't be formatted, it may be a hardware problem.

System errors

Your startup drive mounts on the desktop but you insert or try to mount an additional disk volume and get a system error. Or your disk mounts but, when you try to open files and applications, you consistently get system errors.

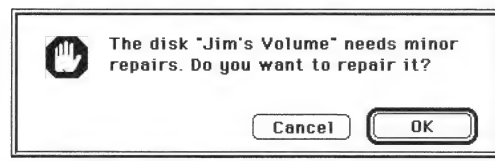


Problems	Solutions
The application that you are trying to open may be damaged.	Replace the application from the locked original disk.
Power or data cable for the external startup drive is not connected properly.	Check the power and data cables.
Volume Information Block is damaged.	Use Norton Disk Doctor.

Problems	Solutions
The logical structure of the disk may be damaged.	Use Norton Disk Doctor.
SCSI device conflict or improper termination.	Check for SCSI device conflict or improper termination.
The desktop file is damaged.	Rebuild the desktop file.
A particular application or its files seems to be causing problems.	Replace or re-install the corrupted application.
Device driver for the disk is damaged.	Replace SCSI device driver, then use Norton Disk Doctor.
Your disk may be infected by a virus.	Use SAM (Symantec Anti-Virus for Macintosh) to eradicate current infections and protect you against future infections.

"The disk <disk name> needs minor repairs. Do you want to repair it?"

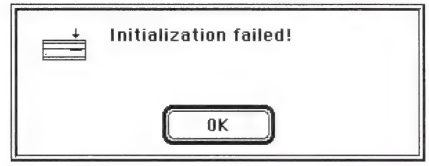
Your startup drive mounts on the desktop but you insert or try to mount an additional disk volume and get the message: "The disk [your volume name] needs minor repairs. Do you want to repair it?"



Problems	Solutions
The desktop file is damaged.	Rebuild the desktop file.
Your disk may be infected by a virus.	Use SAM (Symantec Anti-Virus for Macintosh) to eradicate current infections and protect you against future infections.

Disk initialization failed

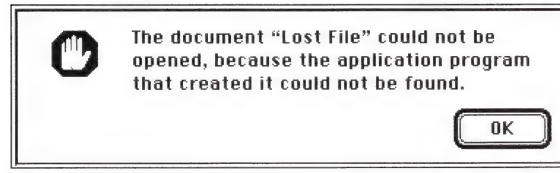
You have tried to initialize a disk and the procedure was not completed reporting that "Disk initialization failed."



Problems	Solutions
Your hard disk volume contains bad blocks or other media damage.	Perform a backup or use Volume Recover to salvage files. This problem may require a service technician. Reformat the disk using the SCSI software that came with the hard drive—this will destroy all data on the disk.
A high-density (1.44 MB) floppy disk has been inserted into an 800K drive or an 800K floppy disk inserted into a 400K floppy disk drive.	Check the floppy disk for compatibility with your floppy drive. (High-density disks usually are marked with the letters HD by the sliding shield or door.)
The floppy disk contains bad blocks.	Format the floppy disk with Floppier. Or dispose the floppy disk and use another.
The floppy disk drive has a hardware problem.	Try to format other floppy disks. If they can't be formatted it is probably a hardware problem.

"The application could not be found."

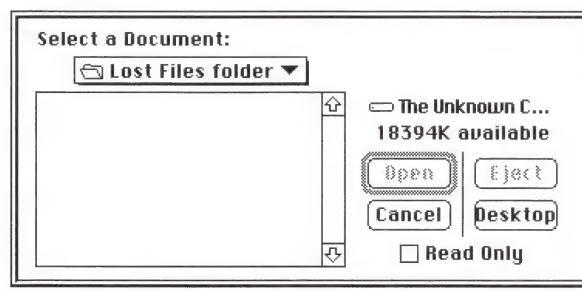
You have tried to launch an application by double-clicking or opening a selected file and you got the message, "The application is busy or missing." or "Application could not be found."



Problems	Solutions
The application is not located on any mounted volume.	Use Fast Find to locate the correct volume.
The logical structure of the disk may be damaged.	Use Norton Disk Doctor.
The desktop file is damaged.	Rebuild the desktop file.
The file signature (type and creator) is damaged or modified and the application can no longer recognize it.	Use Fast Find to locate the file, then use the Get Info command (Settings panel) to add the file signature.
You started up with System 4.1 or earlier. Your files are on the disk, but the Finder can't see them.	Restart using a later revision of the System and Finder.
You replaced your system files with System 4.1 or earlier. The hierarchical file system has been destroyed.	Use Volume Recover to recover files.

Errors accessing a file within an application

The application opens but, when you try access a particular file from within the application, the file does not appear in the open file dialog or will not open.



Problems	Solutions
The files have been relocated.	Use Fast Find to locate the files.
The files have been thrown away accidentally.	Use UnErase to recover the files.
The file signature (type and creator) is damaged or modified and the application can no longer recognize it.	Use Fast Find to locate the file, then use the Get Info command (Settings panel) to add the file signature.
The format of your file is incompatible with the version of the application that you are using.	Locate and use the appropriate version of the application.
You started up with System 4.1 or earlier. Your files are on the disk, but the Finder can't see them.	Restart using a later revision of the System and Finder.
You replaced your system files with System 4.1 or earlier. The hierarchical file system has been destroyed.	Use Volume Recover to recover files.

Files and folders have disappeared

You are unable to locate a file or folder on the desktop.

Problems	Solutions
The file or folder has been moved.	Use Fast Find to locate the file or folder.
The file or folder has been thrown away accidentally.	Use UnErase to recover the files.
The logical structure of the disk may be damaged.	Use Norton Disk Doctor.
The desktop file is damaged.	Use Norton Disk Doctor.
The "invisible" bit has been set for the file or folder.	Use Fast Find to locate the file or folder, then use the Get Info command (Settings panel) to uncheck the item is invisible setting.

File could not be read/written

You were copying, opening, saving or closing a file and got a message that tells you that the file could not be read or written. The wording of the messages may vary slightly from those listed below.

Problems	Solutions
Read message: "The file may be damaged."	Restore a backup copy of the file. Use Norton Disk Doctor.
Write message: "The file "filename" couldn't be written because a disk error occurred. Do you want to continue copying?"	Perform a backup or use Volume Recover to salvage files. This problem may require a service technician. Reformat the disk—this will destroy all data on the disk. **Or** Use Disk Editor to attempt to resurrect a bad sector.
Write message: "The device driver for the disk may be damaged."	Replace SCSI device driver, then use Norton Disk Doctor.
Write message: "The diskette may contain bad blocks."	Use Volume Recover to recover any files. Format the floppy disk with Floppier. **Or** Use Disk Editor to attempt to resurrect a bad sector.
Write message: "Your drive may have a hardware problem."	Use Volume Recover to salvage files. This problem may require a service technician. Reformat the disk—this will destroy all data on the disk.

Where to go next

The following table describes where to find the procedures that use the Norton Utilities for Macintosh.

Solutions	Where to find the procedure
Use Norton Disk Doctor.	Chapter 2, *Disk Repair and File Recovery*
Use Fast Find to locate the correct volume. Use Fast Find to locate the files. Use Fast Find to locate the file or folder.	Chapter 3, *Performing Everyday Operations*
Use Fast Find to locate the file, then use the Get Info command (Settings panel) to add the file signature. Use Fast Find to locate the file or folder, then use the Get Info command (Settings panel) to uncheck the item is invisible setting.	Chapter 4, *Customizing Norton Utilities*
Perform a backup. Restore a backup copy of the file.	Chapter 3, *Performing Everyday Operations*
Format the floppy disk with Floppier.	Chapter 3, *Performing Everyday Operations*
Use Volume Recover to salvage files. This is a serious problem that may require a service technician. Use Volume Recover to recover any files. Use Volume Recover to recover files.	Chapter 2, *Disk Repair and File Recovery*
Use UnErase to recover the files.	Chapter 2, *Disk Repair and File Recovery*
Use Disk Editor to attempt to resurrect a bad sector.	Reference, *Disk Editor*

The following table describes where to find the procedures that are not directly related to the Norton Utilities for Macintosh.

Solutions	Where to find the procedure
Check the power and data cables. Make sure that you are using a working SCSI cable.	Appendix B, *Troubleshooting Guide*
Zap the PRAM.	Appendix B, *Troubleshooting Guide*
Rebuild the desktop file.	Appendix B, *Troubleshooting Guide*
Check for SCSI device improper termination. Check for SCSI device conflict.	Appendix B, *Troubleshooting Guide*
Replace SCSI device driver, then use Norton Disk Doctor.	Appendix B, *Troubleshooting Guide*
Check for init conflict.	Appendix B, *Troubleshooting Guide*
Replace damaged Finder file or if necessary, System and Finder files. Replace damaged system files. Restart using a later revision of the System and Finder.	Appendix B, *Troubleshooting Guide*
Reformat the disk using the SCSI software that came with the hard drive—this will destroy all data on the disk.	*Appendix B, Troubleshooting Guide*
Use SAM (Symantec AntiVirus for Macintosh) to eradicate current infections and protect you against future infections.	SAM is available for purchase from Symantec or your local software vendor.

CHAPTER

2 Disk Repair and File Recovery

Norton Disk Doctor, Volume Recover, and UnErase are the three main tools, in the Norton Utilities for Macintosh, used for disk repair and file recovery. Norton Disk Editor also can be used by experienced or technical users for additional repair and recovery procedures. This chapter shows you how to repair damaged disks and, if necessary, recover files using the first three programs. For more information on using Norton Disk Editor, see its entry in Part II, *Reference*.

Chances are, if you are reading this chapter, you are already in an emergency. Don't panic. Take a deep breath, count to ten and exhale slowly, then turn the page.

Contents

2-3 Before you begin
2-3 Don't install
2-3 Repair versus recovery
2-3 Running Norton Utilities
2-5 Using Norton Disk Doctor
2-10 Using Volume Recover
2-18 Using UnErase
2-25 A final thought

Before you begin

Because determining the cause of a disk problem is not an exact science—your problem could be as simple as a loose cable—it may save you time if you try to diagnose your problems first. Use Chapter 1, "Diagnosing Problems," to help you evaluate the possible causes of your problems and determine which procedure you should follow to fix them.

Don't install

If you have just purchased the Norton Utilities for Macintosh, do NOT try to install it if you are in an emergency. Use the appropriate Emergency Disk included in this package to start your Macintosh and run the Norton Utilities. To find out which disk to use, see the chart in the next section, "Running the Norton Utilities."

Never copy files to a damaged disk or a disk from which you are trying to recover files, because you may destroy information that is vital to the repair or recovery of the disk.

Repair versus recovery

In most cases, Norton Disk Doctor can repair your damaged disk and you can continue using your disk. But if the disk is physically damaged, you may only be able to recover data from the damaged disk. Volume Recover can reclaim files from the damaged disk and copy them to an undamaged disk.

Running Norton Utilities

If your disk or file problem is on your startup drive, you should run the Norton Utilities for Macintosh from the Emergency Disk. You should only run the Norton Utilities from your hard disk if it is already installed on an undamaged disk and the damaged disk is not your startup disk.

› **To start up from the Emergency Disk:**

1 Insert the appropriate Emergency Disk into your internal disk drive and switch on your Macintosh.

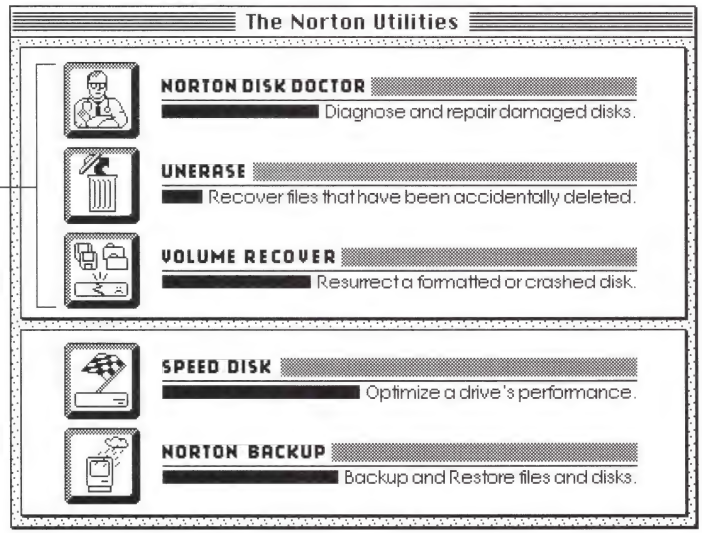
There are two Emergency Disks: a System 7.x startup disk, labeled Emergency Disk HD, on a high-density floppy disk and a System 6.x startup disk, labeled Emergency Disk, on an 800K floppy disk. You should use the disk that matches the operating system you are using on your Macintosh.

2 Switch on your Macintosh.

Your Macintosh will start, and the Main Menu for the Norton Utilities for Macintosh, shown in Figure 2-1, appears.

Figure 2-1

The Norton Utilities for Macintosh Main Menu



Utilities used for disk repair and file recovery

› **To start the Norton Utilities for Macintosh from the folder:**

Use this procedure only if the damaged disk is NOT your startup disk and the Norton Utilities for Macintosh is already installed on a hard disk other than the undamaged one.

1 Open the Norton Utilities 2.0 folder.

2 Open the Norton Utilities for Macintosh icon.
To open the icon, double-click it.

The Norton Utilities for Macintosh Main Menu appears. (See Figure 2-1.)

Using Norton Disk Doctor

There are two typical reasons for using Norton Disk Doctor:

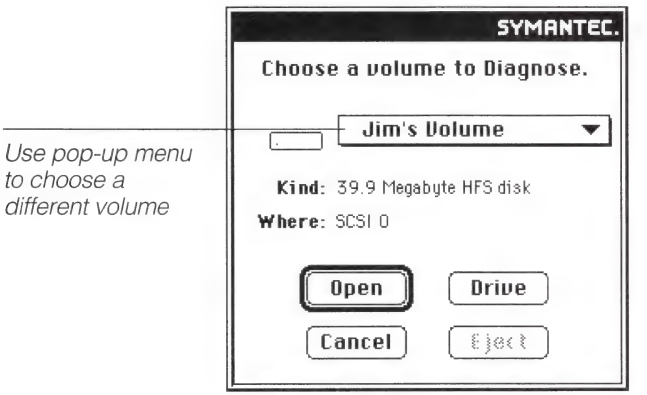
- **Repairing a damaged disk**
  You can't start your Macintosh, a disk is no longer readable, files mysteriously disappear—these are the symptoms of a damaged disk. Most causes of these disk problems can be repaired by Norton Disk Doctor.
- **Diagnosing disk problems**
  You should use Norton Disk Doctor regularly, even if you have no obvious disk problems. It is easier to correct small problems before they become big problems.

› **To use Norton Disk Doctor:**

1 Start the Norton Utilities for Macintosh.
Use the appropriate method described at the beginning of this chapter.

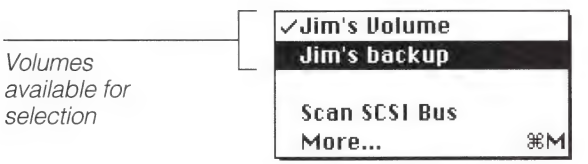
2 Click the Norton Disk Doctor button in the Norton Utilities for Macintosh Main Menu.
The Choose Volume dialog box, shown in Figure 2-2 appears.

Figure 2-2
The Choose Volume dialog box



3 If the damaged disk is a floppy disk, insert the disk into any available floppy drive.
If you have a one-drive system and used the Emergency Disk as your startup disk, you must eject it before inserting the damaged floppy disk. You will be prompted to exchange the two disks at different stages of the repair process.

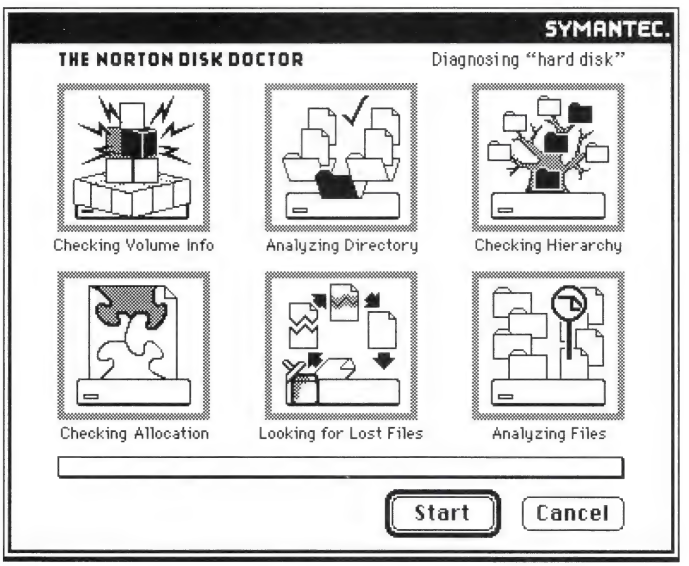
4 Choose your damaged disk from the pop-up menu.
The pop-up menu contains the names of all the available volumes.



If the damaged volume does not appear in the list, you can try to access it by choosing the More command from the pop-up menu. For information on the More command, see "Norton Disk Doctor" in Part II, *Reference*.

5 Click Open.
The Norton Disk Doctor screen, shown in Figure 2-3, appears.

Figure 2-3
Norton Disk Doctor main screen

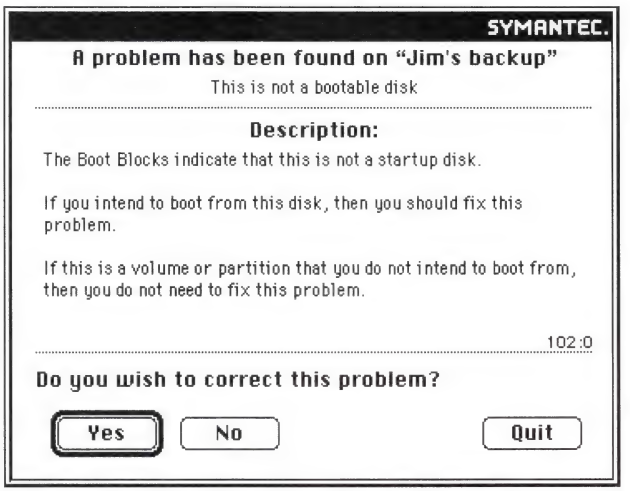


6 Click Start and follow the screen prompts.
Norton Disk Doctor moves through each diagnosis procedure and keeps you informed of its progress.

If a problem is found, a message similar to that shown in Figure 2-4 will appear to describe the problem. You have the option to fix or ignore the problem.

Figure 2-4

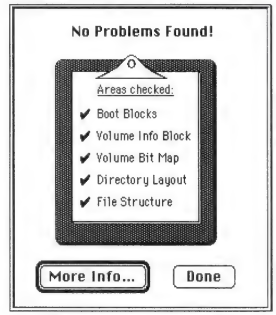
Typical problem message


SYMANTEC.
A problem has been found on "Jim's backup"
This is not a bootable disk
Description:
The Boot Blocks indicate that this is not a startup disk.
If you intend to boot from this disk, then you should fix this problem.
If this is a volume or partition that you do not intend to boot from, then you do not need to fix this problem.
102:0
Do you wish to correct this problem?
Yes
No
Quit

If you just want to see which problems exist, click No at the prompts. Otherwise, you should always click Yes to fix problems.

If the problem cannot be fixed, one of two things will happen. If the problem is critical and the disk unusable, Norton Disk Doctor will ask you if you want to go directly to Volume Recover to try to recover files from the disk. If the problem is less serious, Norton Disk Doctor will simply report the problem and recommend a course of action.

When Norton Disk Doctor completes its diagnosis, it displays a list of areas checked.



You can click More Info to display a report on any problems found and repairs performed. If you want to save the report, you should always save it to a disk other than the repaired disk. This will ensure that if there are still problems, saving the report won't cause more data to be destroyed.

Click Done to return to the Main Menu.

7 Run Norton Disk Doctor again if you fixed any problems.

Sometimes one problem will mask another. Whenever you fix a problem with Norton Disk Doctor, you should always rerun it until no other repairs can be performed.

8 Exit from Norton Disk Doctor and examine your disk.

Check to see that the names of folders and files and that the icons are correct, that important documents can be opened and are correct, and that you can restart your Macintosh without any problems.

If using Norton Disk Doctor is not entirely successful—for example your files appear without their correct names—you should see Appendix B, "Troubleshooting Guide," for other suggestions on repairing your disk.

If you cannot repair the disk, use Volume Recover to retrieve your data and move it to an undamaged disk. You can then try to reformat the damaged disk.

Using Volume Recover

There are three typical reasons for using Volume Recover:

- **Rescuing files from a damaged disk**
  If a disk is so badly damaged that it can't be repaired by Norton Disk Doctor, you can use Volume Recover to regain your critical files. Volume Recover performs best if FileSaver protection is activated before damage occurs, but can recover data from all but the most badly damaged volumes even if FileSaver wasn't installed.

- **Rescuing files from an initialized hard disk**
  Volume Recover can only recover files from an initialized hard disk, not floppy disks. This is because initializing a floppy disk is a different process that physically destroys any data on the disk. Similarly, if a hard disk has been formatted with a low-level formatting application—such as those provided with hard drives—all data is destroyed, and Volume Recover will not work.

  And, of course, you cannot recover disks that have been erased with the Wipe Disk feature of the Wipe Info utility.

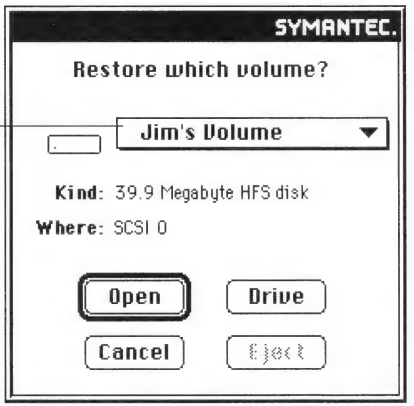
- **Rescuing erased files**
  If you want to recover a few files, use UnErase; if you want to restore many files use Volume Recover. Also, if UnErase doesn't work adequately, use Volume Recover.

› **To use Volume Recover:**

1 Start the Norton Utilities for Macintosh.
Use the appropriate method described at the beginning of this chapter.

2 Click the Volume Recover button in the Norton Utilities for Macintosh Main Menu.
The Volume Selection dialog box, shown in Figure 2-5 appears.

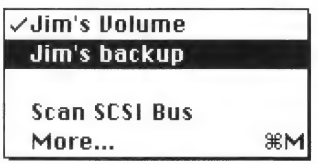
Figure 2-5
Volume Selection dialog box



Use pop-up menu to choose a different volume

3 If the damaged disk is a floppy disk, insert the disk into any available floppy drive.
If you have a one-drive system and used the Emergency Disk as your startup disk, you must eject it before inserting the damaged floppy disk. You will be prompted to exchange the two disks at different stages of the recovery process.

4 Choose the drive you wish to recover from the pop-up menu.
The pop-up menu contains the names of all the available volumes.



Volumes available for selection

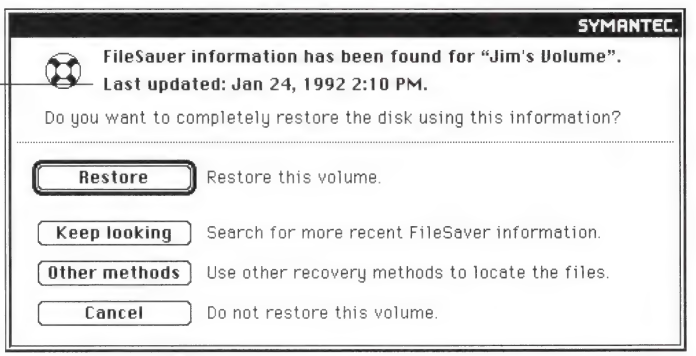
If the damaged volume does not appear in the list, you can try to access it by choosing the More command from the pop-up menu. For information on the More command, see "Norton Disk Doctor" in Part II, *Reference.*

You cannot recover the startup drive, unless you must start up from the Emergency Disk. See "Running the Norton Utilities" at the beginning of this chapter.

5 Click Open.
What happens next depends on whether FileSaver information is available. If FileSaver wasn't installed and active when the damage occurred, skip ahead to "To use Volume Recover without FileSaver."

6 When FileSaver information is found, a dialog box appears.
The dialog box tells you the last date and time that FileSaver information was updated.

Figure 2-6
Volume Recover FileSaver found alert box

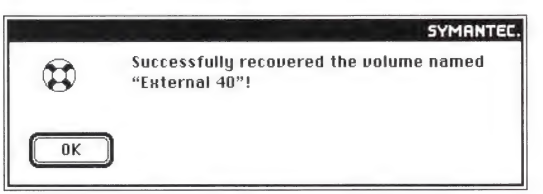

SYMANTEC.
FileSaver information has been found for "Jim's Volume".
Last updated: Jan 24, 1992 2:10 PM.
Do you want to completely restore the disk using this information?
Restore
Restore this volume.
Keep looking
Search for more recent FileSaver information.
Other methods
Use other recovery methods to locate the files.
Cancel
Do not restore this volume.

Check the date and time to make sure that the FileSaver information is recent

7 Click Restore to proceed.
If for some reason the FileSaver information is not usable, continue with the next procedure, "To use Volume Recover without FileSaver."

If the FileSaver information is intact on the damaged disk, the files are automatically restored to the original volume and a dialog box appears.

Figure 2-7
Volume Recover can restore your volume



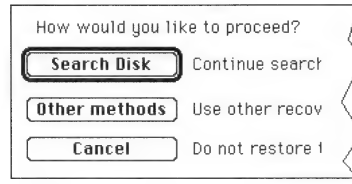
Click OK. You will return to the Norton Utilities Main Menu. You may want to run Norton Disk Doctor to double-check your disk and if you haven't performed a recent backup, now would be a good time to do so.

› **To use Volume Recover without FileSaver:**

This section continues from step 5 of the previous section, "**To use Volume Recover.**"

1 Volume Recover searches for FileSaver information, but cannot find it.
A dialog box appears to let you know that File Saver information was not found and asks what you want to do next.

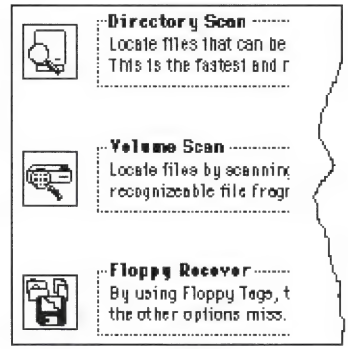
Figure 2-8
Volume Recover: FileSaver not found alert box



2 Click the Other Methods button.
A dialog box appears.

3 You have a choice of three recovery methods: review the next paragraphs before proceeding.

Figure 2-9
Other Methods dialog box



The three recovery methods are described next. Of the three methods, only Directory Scan will restore files to their correct names. If you use the other methods, you will have to examine the files to determine what they contain.

Volume Recover's "Other Methods" of file recovery overlap those used by UnErase. In fact, after this point Volume Recover will work like UnErase.

Directory Scan: Directory Scan searches the disk to find any directory information. The directory contains information about where files are stored on the disk. Volume Recover can usually recover all the files that were recorded in that directory unless the disk was erased.

Volume Scan: Volume Scan searches the disk to find markers that indicate the start of a particular type of file. You can select the types of files for which Volume Recover will search. This method works well on erased volumes.

Floppy Recover: Some floppy disk volumes maintain special housekeeping information, called Floppy Tags, that aids in file recovery. If that information is intact, Volume Recover can use it in the recovery process.

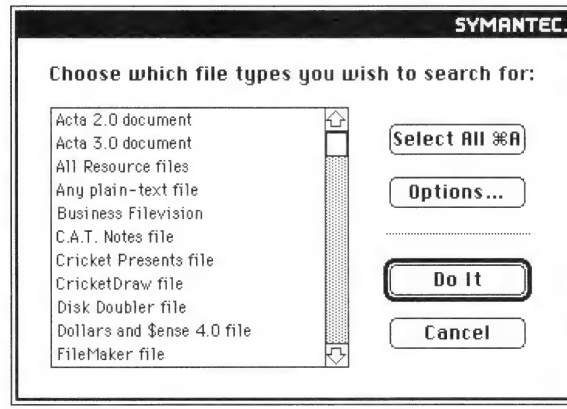
4 Click the recovery method you want to use. You should try the methods in the order listed. If one method doesn't work well, you can exit the program, restart Volume Recover, and choose the next method listed.

What happens next depends on the recovery method selected.

Directory Scan: Volume Recover begins searching for files. After it finishes, the Volume Recover file selection window, shown in Figure 2-10, appears.

Volume Scan: A dialog box appears with all the types of documents for which Volume Recover can search.

Figure 2-10
File types dialog box



- **Click the document type.**
  Scroll through the list until you find the appropriate file type or types that you wish to recover. You can Shift-click to select more than one type or click the Select All button to search for all file types listed. If the file type you want is not listed try Select All.

- **Click Do It to proceed.**
  Volume Recover begins searching for files. After it finishes, the Volume Recover file selection window appears.

  Floppy Recover: Volume Recover begins searching for floppy tags.

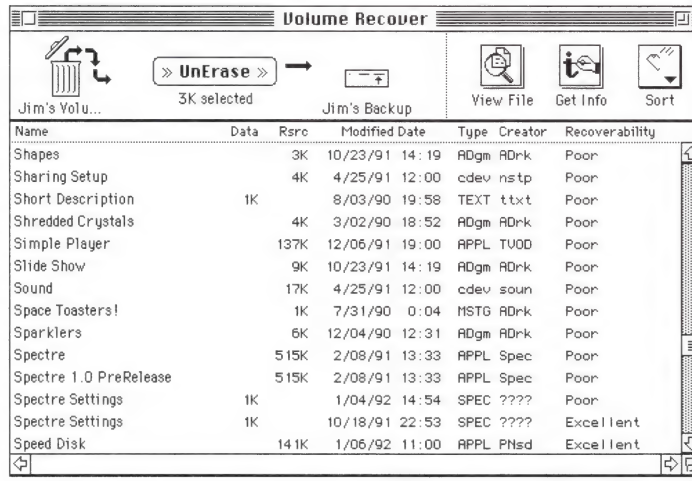
  After it finishes searching, the Volume Recover file selection window appears.

If floppy tags are not found the message, "This drive does not appear to support tags. Try anyway?" will appear. You can try to recover files without floppy tags, but the results may be unsatisfactory. Your best bet is to click No and then try the other methods.

5 Look for the file or files that you want to recover.
Scroll through the Volume Recover file selection list to look for the file or files that you want to recover.

Figure 2-11

Volume Recover File Selection window


Volume Recover
Jim's Volu...
» UnErase »
3K selected
Jim's Backup
View File
Get Info
Sort
Name Data Rsrc Modified Date Type Creator Recoverability
Shapes 3K 10/23/91 14:19 ADgm ADrk Poor
Sharing Setup 4K 4/25/91 12:00 cdev nstp Poor
Short Description 1K 8/03/90 19:58 TEXT ttxt Poor
Shredded Crystals 4K 3/02/90 18:52 ADgm ADrk Poor
Simple Player 137K 12/06/91 19:00 APPL TVOD Poor
Slide Show 9K 10/23/91 14:19 ADgm ADrk Poor
Sound 17K 4/25/91 12:00 cdev soun Poor
Space Toasters! 1K 7/31/90 0:04 MSTG ADrk Poor
Sparklers 6K 12/04/90 12:31 ADgm ADrk Poor
Spectre 515K 2/08/91 13:33 APPL Spec Poor
Spectre 1.0 PreRelease 515K 2/08/91 13:33 APPL Spec Poor
Spectre Settings 1K 1/04/92 14:54 SPEC ???? Poor
Spectre Settings 1K 10/18/91 22:53 SPEC ???? Excellent
Speed Disk 141K 1/06/92 11:00 APPL PNsd Excellent

Select the files you want to recover

The information displayed in the seven columns includes the name of the file, the file size (data fork and resource forks), the date and time the file was last modified, and the file type and file creator codes, and a recoverability assessment, ranging from Excellent to Poor.

Excellent means that the file can usually be recovered entirely. Any other rating means that part of the file has been overwritten and is apt to "come up missing." This can cause problems with many applications.

If you used Directory Scan, the files are listed by filename in alphabetical order. If you used Volume Scan or Floppy Recover, the filenames will not be recovered, and you may need to examine the files to determine what they contain.

Figure 2-12

List of files found using the Volume Scan method

Name	Data	Rsrc	Modified Date	Type	Creator	Recoverability
? Any plain-text file 86	5K		1/01/04 0:00	TEXT	ttxt	Excellent
? Any plain-text file 87	1K		1/01/04 0:00	TEXT	ttxt	Excellent
? Any plain-text file 88	1K		1/01/04 0:00	TEXT	ttxt	Excellent
? Any plain-text file 89	1K		1/01/04 0:00	TEXT	ttxt	Excellent
? Microsoft Word 4.0 file 00	3K		1/01/04 0:00	WDBN	MSWD	Excellent
? Microsoft Word 4.0 file 01	3K		1/01/04 0:00	WDBN	MSWD	Excellent
? Microsoft Word 4.0 file 02	5K		1/01/04 0:00	WDBN	MSWD	Excellent
? Microsoft Word 4.0 file 03	3K		1/01/04 0:00	WDBN	MSWD	Excellent

Select a file and click the View File button to see its contents. You can only view the first 150K of text in the file. You cannot view pictures.

View File

Some files may appear to contain "garbage." You should still attempt recovery as there might be some usable text left in the file.

6 Select the file or files that you want to recover.

Shift-click to select multiple files. Press Command+A to select all files for recovery.

7 If you cannot find the desired file in the list or if the recoverability assessment is poor, try another recovery method.

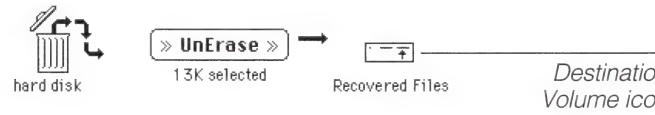
Close the Volume Recover window. Restart Volume Recover by choosing Volume Recover from the Utilities menu.

8 Select the volume on which you want to place your recovered files.

If you are recovering to a floppy disk:

- **Press Command+Shift 1 to eject the Emergency Disk from the internal drive.**
- **Insert the floppy disk on which you want to place the recovered files.**

The floppy drive icon—labeled with the name of the floppy disk—appears as the Destination Volume.



OR

Click the Destination Volume icon until you see the name of the mounted volume to which you want to save files.

Do not save the file to the same volume from which you are trying to recover. You may destroy data and prevent other files from being recovered later.

---

9 Click the UnErase button at the top of the screen.

The Recoverability assessment for each selected file changes to "Recovered" after a successful recovery. A folder named Recovered Files will be created on your destination volume. Any recovered files are placed in this folder.

Using UnErase

Do not install the Norton Utilities onto a disk that has deleted files that you wish to recover. You might accidentally replace the erased data; this makes it impossible to recover.

UnErase is used to recover files that have been deleted. When you drag a file to the Trash, then empty the Trash, the file's bookkeeping information is discarded but the data remains on the disk. This means that the data will remain there until that area of the disk is used again. If your disk is almost full, the data could be overwritten the next time you create a file. The sooner you attempt to recover the file, the better the chances of success.

You cannot recover files that have been erased with the Wipe Info utility.

UnErase works best if the FileSaver program is active and FileSaver protection is installed on each disk. (See Chapter 3, "Performing Everyday Operations" for more information on FileSaver.)

In fact, to use the "Quick UnErase" option effectively, FileSaver protection must have been in use when the file was erased. FileSaver keeps an extra copy of the bookkeeping information of deleted files, making file recovery especially fast and reliable. But even if FileSaver has not been active, you still can use UnErase to recover files by using another recovery method.

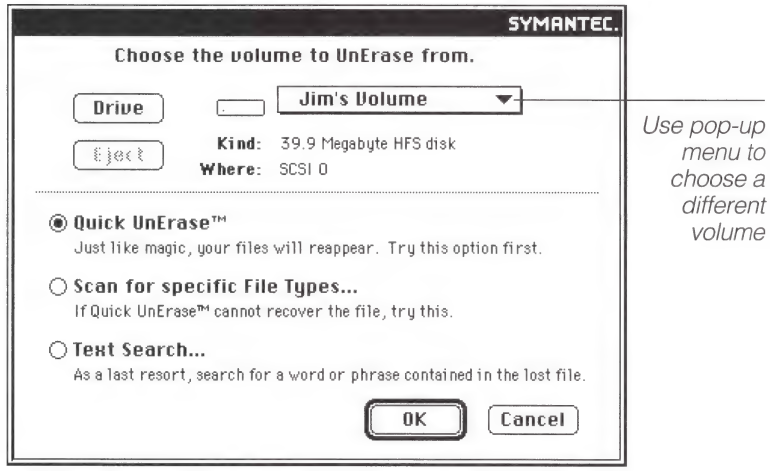
› **To use UnErase:**

1 Start the Norton Utilities for Macintosh.
Use the appropriate method described at the beginning of this chapter.

2 Click the UnErase button in the Norton Utilities Main Menu.
You also can choose UnErase from the Utilities menu.

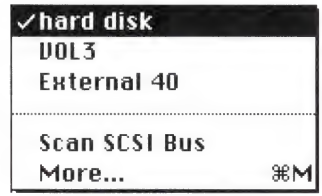
The Choose Volume/UnErase Method dialog box appears.

Figure 2-13
Choose Volume/UnErase Method dialog box


SYMANTEC.
Choose the volume to UnErase from.
Drive
Jim's Volume
Eject
Kind: 39.9 Megabyte HFS disk
Where: SCSI 0
Quick UnErase™
Just like magic, your files will reappear. Try this option first.
Scan for specific File Types...
If Quick UnErase™ cannot recover the file, try this.
Text Search...
As a last resort, search for a word or phrase contained in the lost file.
OK
Cancel
Use pop-up menu to choose a different volume

3 From the pop-up menu, choose the volume that contains your erased files.

The pop-up menu contains the names of all the available volumes. If the erased file is on a floppy disk, insert the disk into any available disk drive.



Volumes available for selection

If the desired volume does not appear in the list, you can try to access it by choosing the More command from the pop-up menu. For information on the More command see "Norton Disk Doctor" in Part II, *Reference.*

4 Click the search method you want to use.

You should try the methods in the order listed. If one method doesn't work well, you can start over and try the next method.

Quick UnErase: To be most effective, Quick UnErase requires FileSaver protection. It can still be used without FileSaver protection because it uses additional techniques to try to recover files, but its reliability is greatly reduced. Upon recovery, the files will be listed by filename.

Scan for Specific File Types: If the file is one of many known file formats, this option will scan the disk to look for sectors that match the given file type. This option works best on files that are not highly fragmented. Upon recovery, the files will be listed by type.

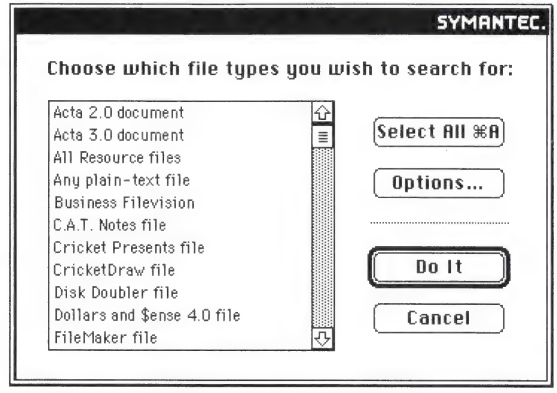
Text Search: This recovers files or fragments of files that contain at least some text. You must know some distinguishing text—a unique word or phrase—to find the desired file. Upon recovery, the file or file fragments will be listed as they are found.

5 Click OK to proceed.
What happens next depends on the search method selected.

Quick UnErase: UnErase begins searching for files. After it finishes, the Norton UnErase window, as shown in Figure 2-14, appears.

Scan for Specific File Types: A dialog box appears with all the types of documents for which UnErase can search.

Figure 2-14
File types dialog box

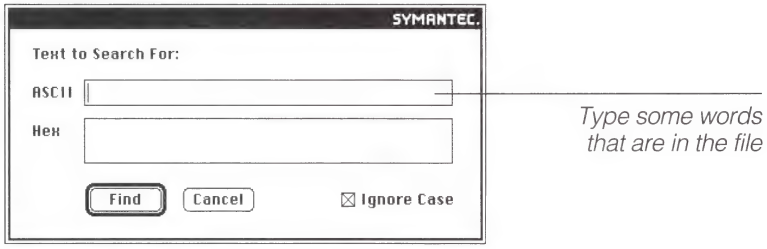


- **Click the document type.**
  Scroll through the list until you find the appropriate file type. You can Shift-click to select more than one type or click the Select All button to search for all file types listed. If the file type you want is not listed, try Select All.
- **Click Do It to proceed.**
  UnErase begins searching for files. After it finishes, the UnErase window appears.

Select Text Search: A dialog box appears into which you must type a few words that you are certain appear in the file you want and preferably not in any other. The match must be exact; a few "scattered" words will not work.

Figure 2-15

Text Search dialog box



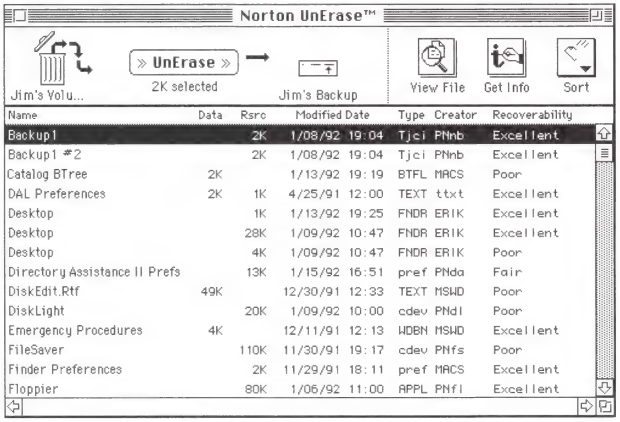
- **Type the text.**
- **Click Find to proceed.**
  UnErase begins searching for files. After it finishes, the UnErase window appears.

6 Look for the file or files that you want to recover.

Scroll through the UnErase list to look for the file or files that you want to recover.

Figure 2-16

UnErase File Selection window


Norton UnErase™
Jim's Volu...
» UnErase »
2K selected
Jim's Backup
View File
Get Info
Sort
Name Data Rsrc Modified Date Type Creator Recoverability
Backup1 2K 1/08/92 19:04 Tjci PNnb Excellent
Backup1 #2 2K 1/08/92 19:04 Tjci PNnb Excellent
Catalog BTree 2K 1/13/92 19:19 BTFL MACS Poor
DAL Preferences 2K 1K 4/25/91 12:00 TEXT ttxt Excellent
Desktop 1K 1/13/92 19:25 FNDR ERIK Excellent
Desktop 28K 1/09/92 10:47 FNDR ERIK Excellent
Desktop 4K 1/09/92 10:47 FNDR ERIK Poor
Directory Assistance II Prefs 13K 1/15/92 16:51 pref PNda Fair
DiskEdit.Rtf 49K 12/30/91 12:33 TEXT MSWD Poor
DiskLight 20K 1/09/92 10:00 cdev PNdl Poor
Emergency Procedures 4K 12/11/91 12:13 WDBN MSWD Excellent
FileSaver 110K 11/30/91 19:17 cdev PNfs Poor
Finder Preferences 2K 11/29/91 18:11 pref MACS Excellent
Floppier 80K 1/06/92 11:00 APPL PNfl Excellent

The information displayed in the seven columns includes the name of the file, the file size (data fork and resource forks), the date and time the file was last modified, and the file type and file creator codes, and a recoverability assessment, ranging from Excellent to Poor.

Excellent means that the file can usually be recovered entirely. Any other rating means that part of the file has been overwritten and is apt to "come up missing." This can cause problems with many applications.

If you used Quick UnErase the files are listed by filename in alphabetical order. If you used Scan for specific File Types or Text Search the filenames will not be recovered, and you may need to examine the files to determine what they contain.

Name	Data	Rsrc	Modified Date	Type	Creator	Recoverability
Shapes		3K	10/23/91 14:19	ADgm	ADrk	Poor
Sharing Setup		4K	4/25/91 12:00	cdev	nstp	Poor
Short Description	1K		8/03/90 19:58	TEXT	ttxt	Poor
Shredded Crystals		4K	3/02/90 18:52	ADgm	ADrk	Poor
Simple Player		137K	12/06/91 19:00	APPL	TVOD	Poor
Slide Show		9K	10/23/91 14:19	ADgm	ADrk	Poor
Sound		17K	4/25/91 12:00	cdev	soun	Poor
Space Toasters!		1K	7/31/90 0:04	MSTG	ADrk	Poor

Select a file and click the View File button to see its text contents. You can only view the first 150K of text in the file. You cannot view pictures.

View File

Some files may appear to contain "garbage." You should still attempt recovery as there might be some usable text left in the file.

7 Select the file or files that you want to recover.
Shift-click to select multiple files. Press Command+A to select all files for recovery.

8 If you cannot find the desired file in the list or if the recoverability assessment is poor, try another UnErase method. Choose Start Over from the File menu.
This returns you to the dialog box shown in step 3. Go to step 4 and choose the next recovery method.

If you cannot recover data from a floppy disk using UnErase, try using the Floppy Recover option in Volume Recover.

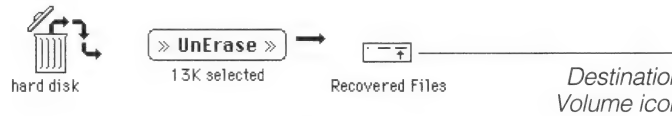
If you still cannot locate the erased file, try using the three methods in Volume Recover. If none of these methods work, the erased file has probably been replaced by another file and you cannot recover it.

9 Select the volume on which you want to place your recovered files.

If you are recovering to a floppy disk:

- **Press Command+Shift 1 to eject the Emergency Disk from the internal drive.**
- **Insert the floppy disk on which you want to place the recovered files.**

  The floppy drive icon—labeled with the name of the floppy disk—appears as the Destination Volume.



OR

Click the Destination Volume icon until you see the name of the mounted volume to which you want to save files.

Do not save the file to the same volume from which you are trying to recover. You may destroy data and prevent other files from being recovered later.

---

10 Click the UnErase button at the top of the screen.

The Recoverability assessment for each selected file changes to "Recovered" after a successful recovery. A folder named Recovered Files will be created on your destination volume. Any recovered files are placed in this folder.

A final thought

When you see how simple it can be to repair a disk or recover a file, it is easy to put off performing a backup or even installing FileSaver. However, Norton Backup and FileSaver should be your front-line defense against the loss of data.

To find out how to use these valuable tools, see Chapter 3, "Performing Everyday Operations."

CHAPTER 3

Performing Everyday Operations

It's a good idea to make Norton Utilities for Macintosh a part of your daily computing routine. In this chapter, you will learn how to make Norton Backup a regular part of your routine, add files and folders to Directory Assistance menus; use FileSaver to save essential information about your files; use Fast Find to locate files on your hard disk, and KeyFinder to find special characters. You'll also find out how to use DiskLight to monitor disk read-write activity, and how to use Floppier to format disks and create and copy disk images (files that represent the contents of an entire disk). Finally you will learn how to access on-line help from within any utility.

Following the procedures in this chapter will make your everyday operations faster, safer, and more efficient.

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3-3 Creating a backup with Norton Backup
3-3 Creating a New Backup
3-5 Updating a Backup
3-7 Activating FileSaver
3-9 Final Notes
3-9 Using Directory Assistance II
3-10 Using DA II with a directory's list
3-13 A brief discussion of worksets
3-13 Adding file and folder names to the menus
3-14 Opening and Saving Files
3-16 Locating Files and Folders with Fast Find
3-18 Finding a font character with KeyFinder
3-21 Copying and formatting floppy disks
3-24 Monitoring your hard disk with DiskLight
3-26 Using On-line Help

Creating a backup with Norton Backup

Backing up your files with Norton Backup is quick and easy enough to do every day. It's a good idea to establish a cycle that includes daily backups. This procedure shows you how to start a cycle by creating a new backup, and how to update it daily or as frequently as you want.

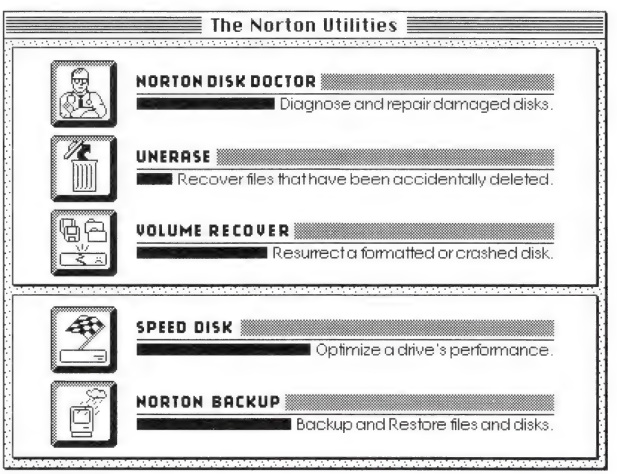
Creating a New Backup

You do not have to back up an entire volume (your hard disk, say), unless you want. Norton Backup backs up only the files you have selected. (Before you begin, make sure that you have a supply of floppy disks and labels ready. Norton Backup will give an estimate of how many you need.)

1 Start the Norton Utilities for Macintosh.
The Norton Utilities window appears.

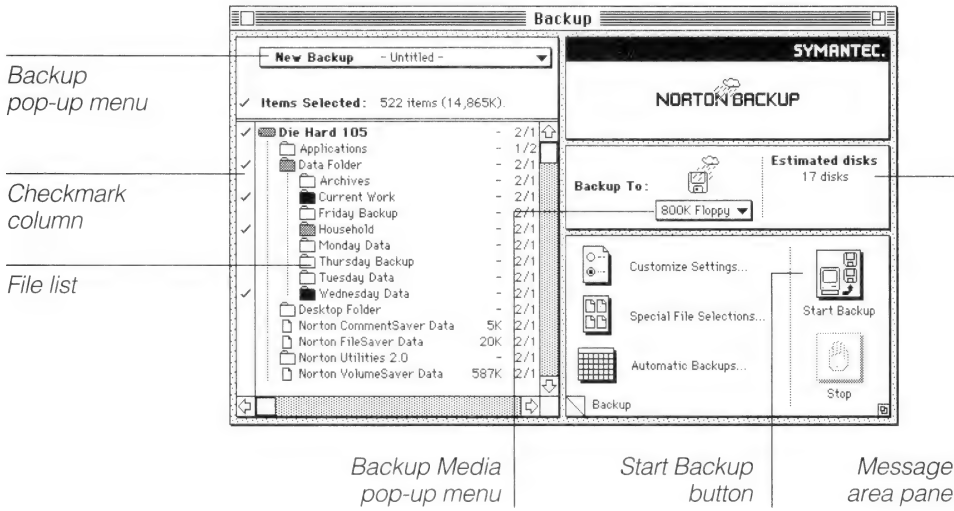
If you'd rather start Norton Backup in the Finder, you can open the Norton Utilities folder and double-click the Norton Backup icon.

Figure 3-1
The Norton Utilities window



2 Click the Norton Backup button
The Backup window appears.

Figure 3-2
The Backup Window



3 Choose the type of backup media from the Backup To: pop-up menu.
Your choices are 400K Floppy, 800K Floppy, 1.44MB Floppy, and Macintosh File (a single file containing all your backup files, compressed). When you choose a type, Norton Backup shows the estimated disks you'll need for the backup.

4 To back up specific files and folders, double-click the volume icon to expand it, then click in the checkmark column to the left of the file or folder's icon.
To back up an entire volume, click in the checkmark column to the left of the volume icon.

Start Backup

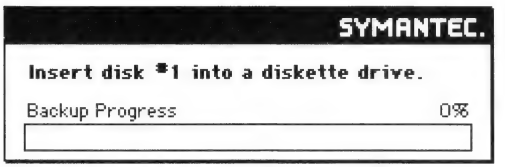
5 Click the Start Backup button.
A Save As dialog box appears. Norton Backup records information about your backup in a backup description file.

6 Type a name for the backup description file.
Give the file a name that describes the contents of your backup or what backup cycle you are using. For example, you could name your backup description file "Sales Invoices" or "Daily Backup."

Before you save this file, navigate to the volume or drive where you want to save your backup data.

7 Click Save.
The backup process begins.

8 If you are backing up to floppy disks, follow the prompts in the Message pane.
Make sure to label and number each diskette as you go along.



The Message pane reports when the backup is successfully completed. It also tells you whether any compression occurred.

9 Click Done when the backup is complete.
This confirms that the backup is complete.

10 Click the close box.

OR

Choose Quit from the File menu to leave Norton Backup.

Updating a Backup

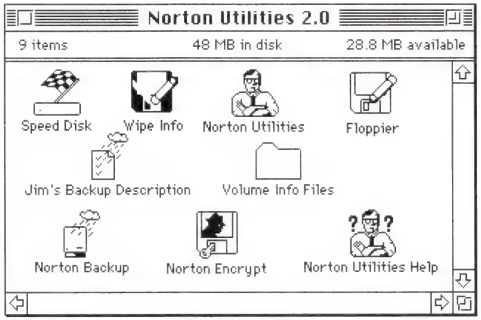
How frequently you back up your data depends on how often you create and modify files. As a general rule, it's a good practice to update your backup daily and make a complete backup weekly.

› **To update an existing backup:**

Backup file 1

1 Start Norton Backup by double-clicking a backup description file icon.

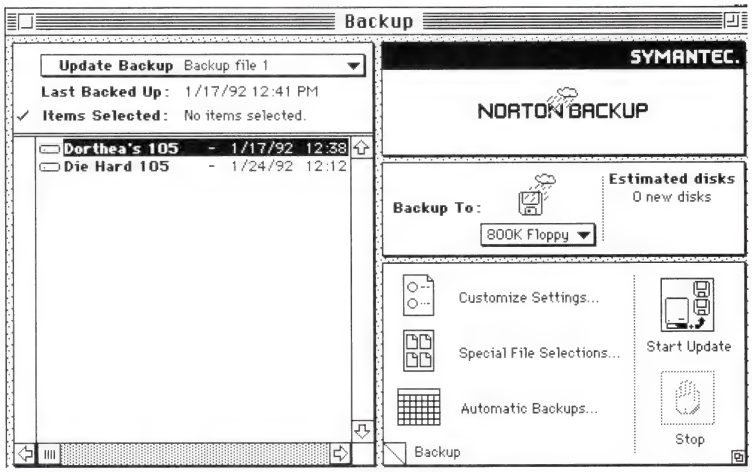
A backup description file is created with every backup, and contains a catalog of the files in that backup. The backup description files are stored in the Norton Utilities folder unless you specified a different location.



The Norton Backup window appears, showing the selected backup description file.

Figure 3-3

The Norton Backup window



Before you begin, make sure that you have floppy disks and labels ready. If you are not sure how many you will need, look at the estimated figure in the media pane.

2 Select any new files you want to include in the update backup.
Norton Backup automatically selects files that have changed since the last backup. If you wish, you can add other files (or folders or entire volumes) to the backup at this point.

3 Click the Start Update button.
Norton Backup shows its progress in the message pane.

4 If backing up to floppy disks, follow the prompts and insert disks as needed.
Make sure to label and number each disk of the backup set as you go along.

The Message pane reports when the update is successfully completed. It will also tell you if any compression occurred.

5 Click the OK (checkmark) button.
This completes the update backup.

6 Click the Close box to quit Norton backup.

For more information on settings and options you can use during a backup, see "Norton Backup" in Part II, *Reference*.

Activating FileSaver

FileSaver creates special files on your disk in which it keeps records of all your documents, applications, and folders. When you throw a file in the Trash, FileSaver makes a note of it. UnErase and Volume Recover use FileSaver's information to restore accidentally erased files and recover damaged disk.

If you chose not to activate FileSaver protection during Norton Utilities installation, here's how to start it now.

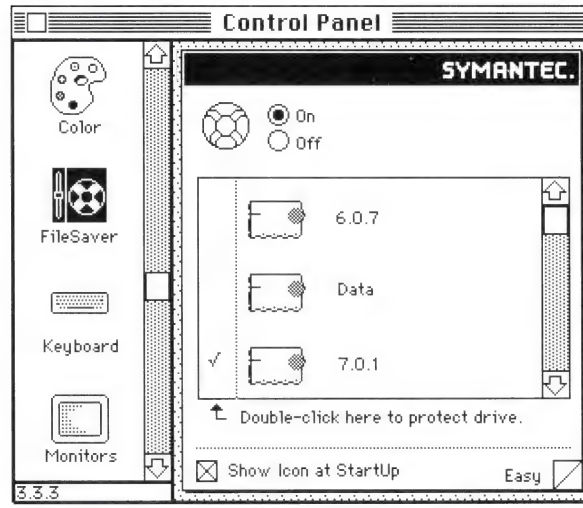
› **To activate FileSaver:**

1 Choose Control Panel from the Apple menu.

2 Select the FileSaver icon.

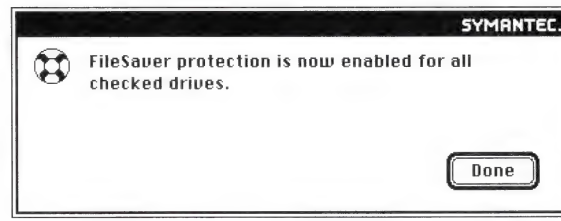
Choose Control Panels from the Apple menu. In the Control Panel folder, double-click the FileSaver icon.

The File Saver control panel appears.



3 Click the On button to activate FileSaver.
A list of available disk volumes appears.

4 To select a volume for protection, double-click in the column to the left of its icon.
A checkmark appears next to protected volumes.



More options are available in FileSaver's Expert level. These options are explained in Part II, Reference.

- **To change levels, click the page corner at the bottom right of the FileSaver panel.**

5 Click the close box to leave FileSaver.

Final Notes

FileSaver will not protect floppy disks from accidental formatting; floppy disks are completely erased whenever they are formatted, and all information on them is lost.

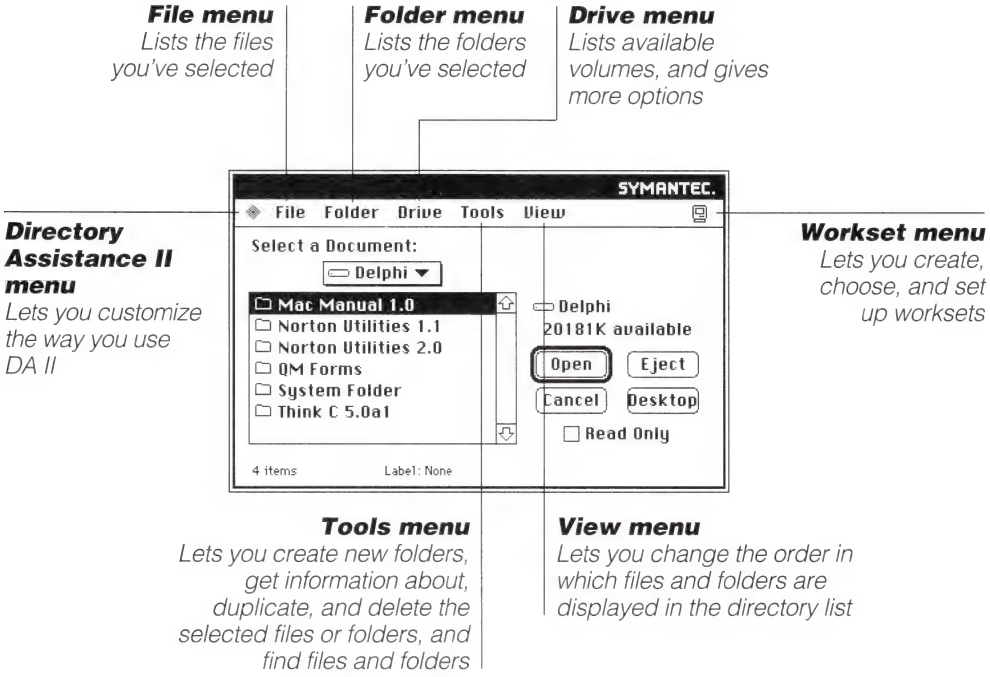
If the files on a Filesaver-protected floppy disk are merely dragged to the Trash, however, they'll be recoverable. FileSaver will not protect disks from formatting by low-level formatting applications, such as those routinely provided with hard drives.

Using Directory Assistance II

Directory Assistance II (DA II) makes the Open and Save As dialog boxes—often referred to as directory dialog boxes—more flexible and easier to use. Now you can create a new folder, search for files, or unlock a file, all without leaving the directory dialog box. You can change the order in which files and folders are displayed to make items easier to find in the directory list. DA II can also give you access to the files, folders, and drives that you use most often, without having to find your way through the directory structure.

The DA II menu bar, as shown in Figure DA-1, appears at the top of any Open, Save, or Save As dialog box.

Figure 3-4
The Open dialog box with DA II active



This chapter explains how to use the File, Folder, Drive, Tools, and View menus. The DA II and Workset menus are explained in Chapter 4, "Customizing Norton Utilities."

Using DA II with a directory's list

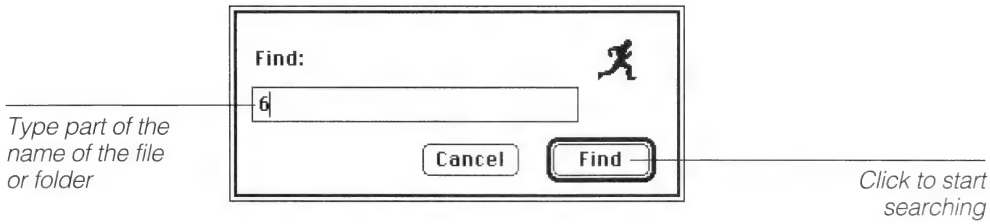
The basic features of DA II adds Finder-like capability to a directory dialog box. This section assumes that you have opened an application program and have selected Open or Save As from the application program's File menu.

› To search for a file or folder:

The search is performed in the current directory. Use this to search for a file to open or directory to which you can save a file.

1 Choose Find from the Tools menu.
A dialog box appears.

Fig 3-5
Find dialog box



2 Type the name or part of the name for which you want to search.
DA II looks for any file name or folder name the current application recognizes that contains the characters you type.

3 Click the Find button.
The first file or folder found will be highlighted.

4 To continue searching, choose Find Again from the Tools menu.
When you find the file or folder, proceed as you normally would within the program.

› **To sort files and folders by characteristics:**

1 Choose Name, Date, Size or Color from the View menu.
When you open the View menu a checkmark appears next to the sorting method in use. The files and folders can be sorted using the following methods:

Name	Alphabetically by name
Date	By the date it was created, with the most recent file first
Size	Largest to smallest
Color or Label	By color in System 6 By label in System 7

The next time you open the View menu, the checkmark appears next to the new sorting method.

› **To group files and folders:**

1 Choose Folders Mixed, Folders First, or Folders Last from the View menu.
When you open the View menu, a checkmark appears next to the sorting method in use. The folders are sorted in the following manner:

Folders Mixed	Folders are not sorted separately from files.
Folders First	Folders are grouped and sorted separately and are displayed at the top of the main list.
Folders Last	Folders are grouped and sorted separately and are displayed at the bottom of the main list.

The next time you open the View menu, the checkmark appears next to the new sorting method.

› **To copy a file or folder:**

1 Select the file or folder to copy from the directory list.

2 Choose Duplicate from the Tools menu.
The new file or folder will be added to the directory list. In System 6, the file copy will have the same name as the original with the words "Copy of" added in front of the original's name. In System 7, "copy" will be added to the end of the name.

› **To delete a file or folder:**

1 Select the file or folder to delete from the directory list.

2 Choose Delete from the Tools menu.
A dialog box appears.

If the selected item is a folder, the message will tell you how many files are contained in the folder.

3 Click the Delete button.
The file or folder is deleted.

› **To create a new folder:**

1 **Choose New Folder from the Tools menu.**
A dialog box appears.

2 **Type the name of the new folder.**

3 **Click the Create button.**
The new folder becomes the current directory and its name appears in the pop-up menu.

A brief discussion of worksets

Whenever Directory Assistance II is active, a workset is in use. Directory Assistance II stores the location of files and folders in its Preferences file. You can use the information in a workset to get to your files and folders without having to maneuver through the disk's directory structure.

When DA II is installed, it is set up to use the Universal Workset. Every time that you use a directory dialog box—such as Open or Save As—in an application program, the location of the selected files and folders is stored in the Universal Workset. Because you can use this tracking feature of the Universal Workset without having to learn about worksets, this chapter stops at the basics. If you want to learn more about how worksets can increase your efficiency, see Chapter 4, "Customizing Norton Utilities."

Adding file and folder names to the menus

The Universal Workset (unless it has been modified) automatically adds to the File and Folder menus,the names of the last five files and five folders that have been opened using a directory dialog box. When a sixth item is opened, the first item is dropped from the list to make room for the new item.

You can also manually add the names of files and folders to the menus. The advantage of adding an item to the menu is that it will stay in the menu until you remove it.

› **To add a file to the Universal Workset:**

1 **Open the application you'll be working with.**

2 **Choose Open from the application's File menu.**
Unless and until you create and assign a different workset for an application (see next procedure), the Universal Workset always appears.

3 **Select the file you wish to add to the Workset.**
Find the file you wish to add in the scrolling list, and click to select it.

4 **Choose Add Selected File from the DA II File menu.**
The file's name appears as a "permanent" file in the DA II File menu. Anytime you want to use this file you can choose it from the File menu. Because DA II remembers the file's location, you will never have to switch drives or folders to use the file.

› **To add a folder to the DA II Folder menu:**

Using the Add Selected Folder command, you can add a favorite folder to the DA II Folder menu in like manner.

System 7 users can add aliases to disk drives to the Drive menu.

Opening and Saving Files

This section assumes that the files and folders mentioned already have been added to the menus.

› **To open a file:**

■ **Choose the filename from the File menu.**
The file is opened.

OR

1 **Choose QuickFile from the File menu**
A dialog box appears.

The files are listed alphabetically.

2 Select the name of the file you wish to open.
To find a file quickly, type the first letter of the filename. The highlight moves to the first file in the list that starts with that letter.

3 Click the Done button.
The file is opened.

› **To change folders:**

■ **Choose the folder name from the Folder menu.**
The folder becomes the current directory and its name is displayed in the pop-up menu.

OR

1 Choose QuickFolder from the Folder menu.
A dialog box appears.

The files are list alphabetically.

2 Select the name of the folder you wish to open.
To find a folder quickly, type the first letter of the folder name. The highlight moves to the first folder in the list that starts with that letter.

3 Click the Done button.
The folder becomes the current directory and it's name is displayed as the directory title.

› **To change drives:**

■ **Choose the drive name from the Drive menu.**
The drive becomes the current directory and its name is displayed in the pop-up menu.

OR

1 Choose QuickDrive from the Drive menu.
A dialog box appears.

The drives are list alphabetically.

2 Select the name of the drive you wish to open.
To find a drive quickly, type the first letter of the drive name. The highlight moves to the first drive in the list that starts with that letter.

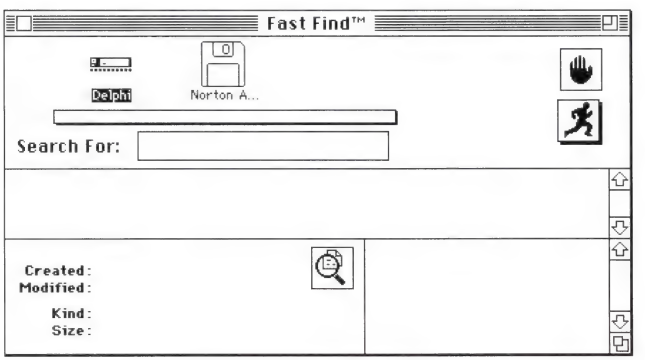
3 Click the Done button.
The drive becomes the current directory and it's name is displayed as the directory title.

Locating Files and Folders with Fast Find

Fast Find is a desk accessory that allows you to find files and folder quickly, move them to the desktop and open them, and view and copy data from text files instantly without opening the applications that created them. Once Fast Find is installed as a desk accessory in the Apple menu, you can use it to locate files or folders on any volume.

› **To locate a file with Fast Find:**

1 Choose Fast Find from the Apple menu.
The Fast Find window appears, displaying available volumes to search.



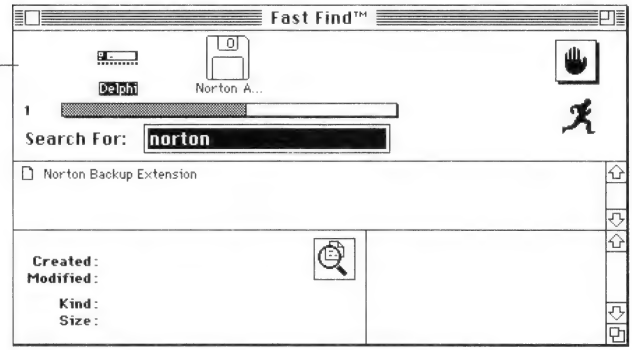
If you've put Fast Find somewhere other than the Apple menu, double-click its icon to start it. If it is still in its suitcase, drag it out of the suitcase first.

2 In the Fast Find window, click the volume icon you want to search.

The startup volume should be already selected. Shift-click to add more volumes, or type Command–A to include all available volumes.

3 In the text box, type all or part of the filename you wish to locate, and press Return or click the running man button.

The button animates and the progress bar begins to fill, indicating how much of the disk(s) has been searched and how much remains.

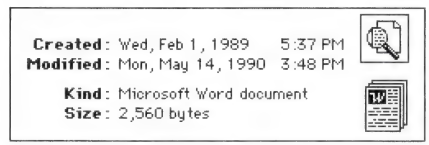


Fast Find main window search in progress

As the search progresses, any files that match the text you typed appear in the scrolling list.

4 Click a file's name to see more information about it.

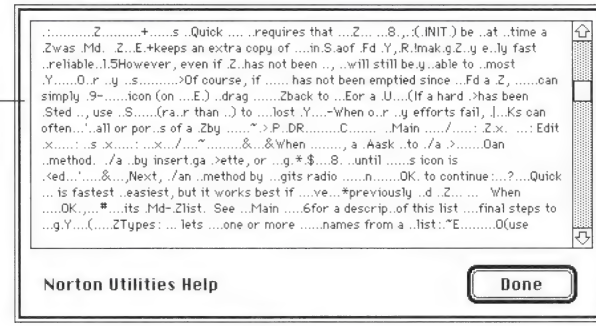
You don't have to wait for Fast Find to finish searching. As you click on a file or folder, information appears in the lower-left panel.



› **To view the contents of a selected file:**

■ **Click the View File (magnifying glass) button.**
A window shows the file's literal contents (text only, no graphics). It will not be formatted and may contain strange characters.

Viewing text-only documents produces best results.



Fast Find viewing file

› **To open a document or launch an application that you've located:**

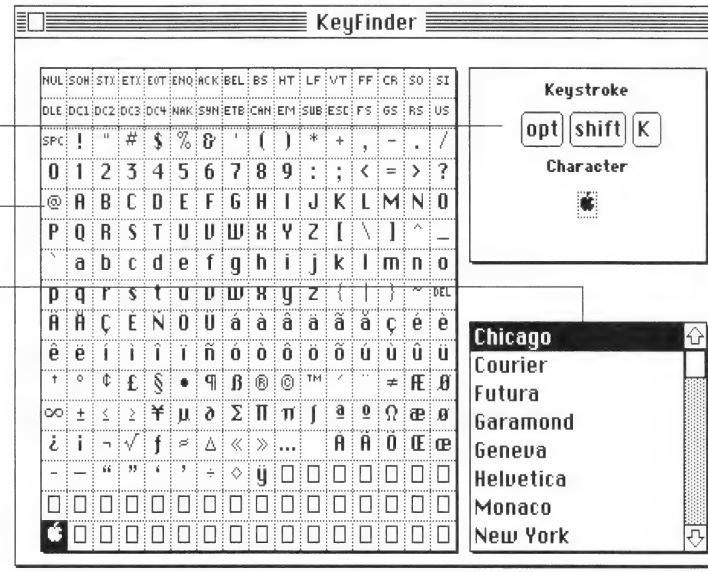
■ **Double-click its name or type Command–O.**
Fast Find finds and start the application.

For more information on Fast Find, see "Fast Find" in Part II, *Reference.*

Finding a font character with KeyFinder

› **To find the key combination for a character in a particular font:**

1 **Choose KeyFinder from the Apple menu.**
The KeyFinder window appears.

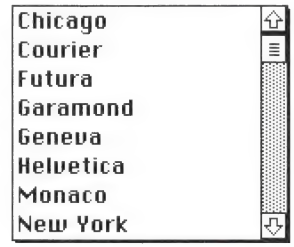


Key combination for selected character

Character grid

List of available fonts

2 Select a font in the scroll list.



The character grid is redrawn using the newly selected font.

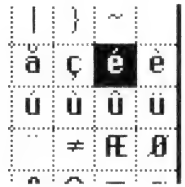
3 In the grid, select the character you want.
The keystroke combination appears in the upper-right corner of the KeyFinder window. Press this combination in a document to obtain the selected character.

For some characters, you press two or three keys simultaneously, while for others, you press keys in sequence. In the KeyFinder window, keys that must be pressed simultaneously are spaced closely together; keys that must be pressed in sequence are spaced farther apart.

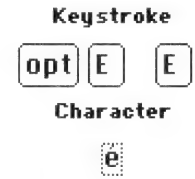
Examples:

To obtain a lowercase letter "e" with the acute accent, as in the French word *résumé*, you must hold down the Option key and type the letter "e", then release the Option key and type the letter "e" again.

To produce this

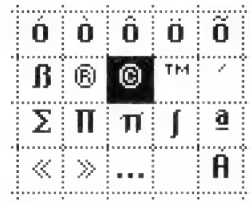


Type this combination



To obtain the copyright symbol (©) you must hold down the Option key and type the letter "g".

To produce this



Type this combination

Copying and formatting floppy disks

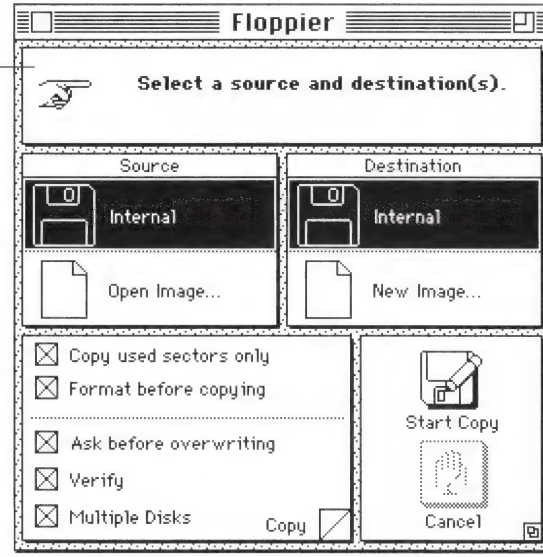
Floppier improves on the standard copy and format functions for floppy disks. Use the following procedures to create a *disk image file* (a mirror image of a floppy disk) on your hard disk and copy the disk image file to other floppy disks. You can also format floppy disks quickly and easily with Floppier.

› **To create and copy a disk image file:**

1 Start Floppier by double-clicking its icon in the Norton Utilities folder.

The Floppier main window appears, set to the copy layer.

Your internal floppy disk drive is selected automatically, for both the source and the destination.

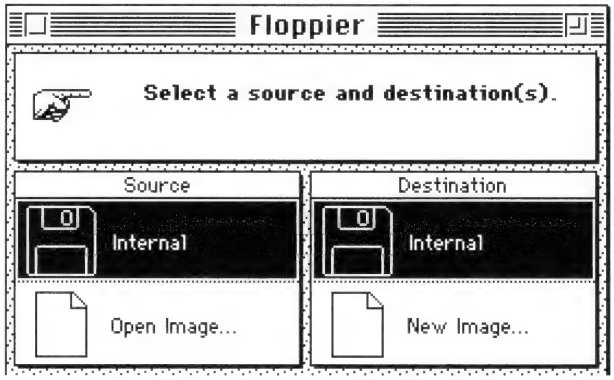


Floppier main window, copy layer

7 Drag a floppy disk icon or a disk image file to the Floppier icon to start Floppier. It will be set to copy the disk or image file that you dragged to it.

2 Click Internal or Open Image on the Source panel to select the source.

Floppier is preset to copy from your internal floppy drive. If you have a disk image file on your hard disk, click Open Image. Floppier opens a dialog box and asks you to select the disk image file to use as your source.

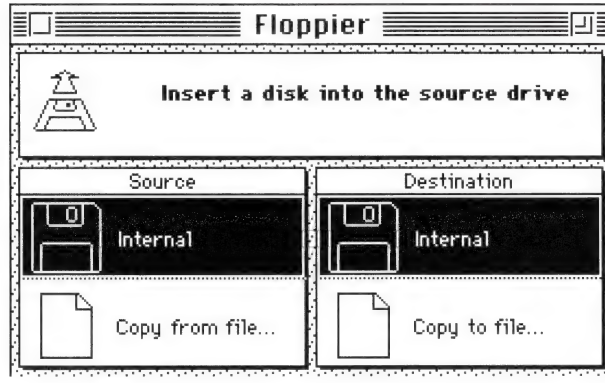


3 Click Internal or New Image on the Destination panel to select the destination.

Floppier is preset to to copy to your internal floppy drive. If you are creating a disk image file on your hard disk, click New Image. Floppier will ask you to name the new image file.

4 Click the Start Copy button and follow the on-screen instructions.

Watch the top part of the Floppier window for messages. Floppier will tell you to insert a disk when necessary.



Floppier informs you when the copy is complete.

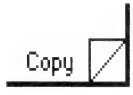
6 To leave Floppier, click the close box.

To make another copy of the same disk or disk image, click Start Copy.

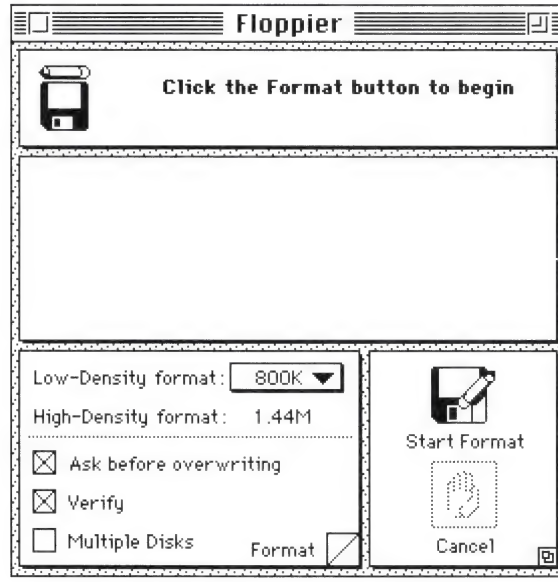
Formatting floppy disks with Floppier

› **To format a floppy disk:**

1 Double-click the Floppier icon in the Norton Utilities folder.
The Floppier main window appears, set to the copy layer.



2 Click the page corner at the lower right of the options panel.
Floppier's Format layer appears. (You can also choose Go to Format from the Floppier menu.)



3 Choose a disk size from the pop-up menu.
Note that high density (HD) disks can only be formatted as 1.44 MB disks.

4 Click the Start Format button and follow the on-screen instructions.
Floppier formats the floppy disk and ejects it when finished.

5 To leave Floppier, click the close box.

To make another copy of the same disk or disk image, click Start Copy.

Monitoring your hard disk with DiskLight

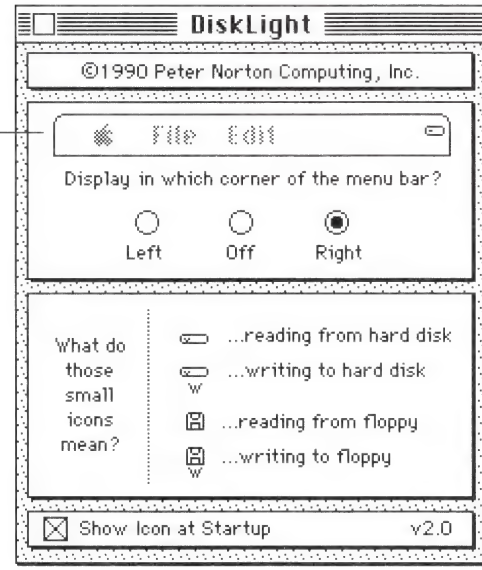
DiskLight keeps you informed of read/write activity on your hard drives and floppy disks. The Installation procedure copies the DiskLight startup document/control panel device to your startup System Folder. You must restart your Macintosh before it becomes active.

When installed, the DiskLight icon appears in the right corner of the menu bar.

› **To change the location of the DiskLight icon:**

1 Choose Control Panel from the Apple menu.

2 Open the DiskLight icon.
The DiskLight control panel appears.



DiskLight control panel

3 Click the Left or Right radio button, or the left or right side of the menu bar.

If your Macintosh is connected to a network, you should make sure the DiskLight icon appears on the right side of the menu bar, because the network activity icon appears on the right side.

4 To quit DiskLight, click the close box.
Your changes are saved automatically. DiskLight shows separate icons for floppy disks and hard disk drives. A letter "w" appears under the disk icon when an application is writing to a disk; DiskLight displays an "r" when an application is reading from a disk.

Menu with AppleTalk icon

DiskLight

Using On-line Help

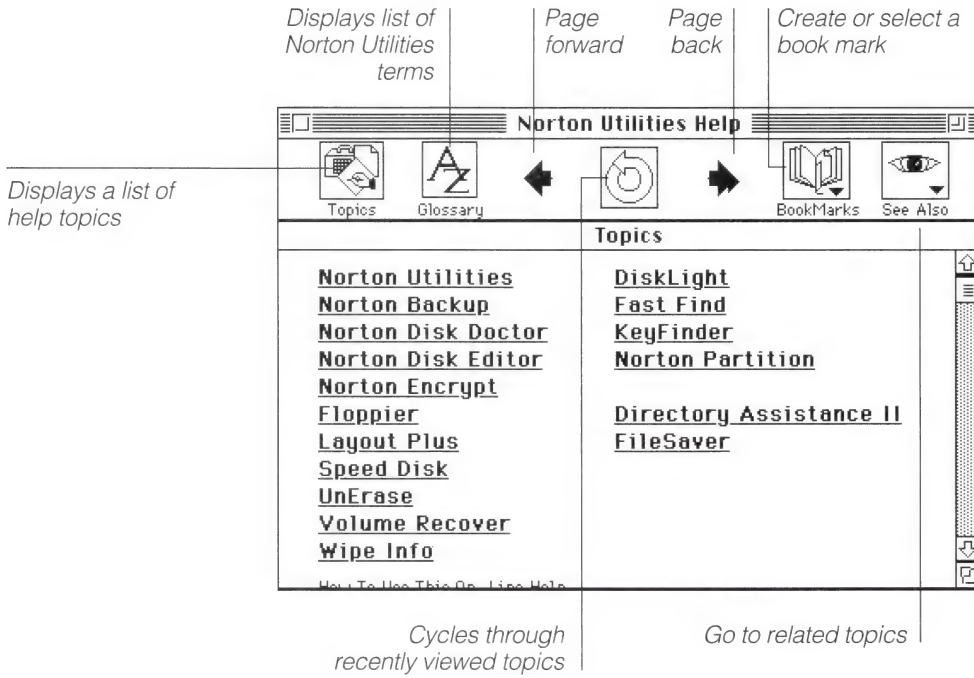
› **To use Norton Utilties on-line help:**

- **Choose Norton Utilities Help from the Apple menu.**

  7 From the Balloon Help menu, choose Norton Utilities Help.

- **If you're using an Apple Extended Keyboard or compatible, press Help.**
  The Norton Utilities help window appears, with help about the utility you're using.

  An underlined word or phrase indicates a *hyperlink* to additional information. Click the underlined text to see more information.



CHAPTER

4 Customizing Norton Utilities

The Norton Utilities can help you become more productive by letting you modify the way that you work with your Macintosh. In this chapter you will learn how to use Directory Assistance II to open and save documents more efficiently; use Fast Find to modify Finder information for files, folders, and application programs; use Norton Partition to help organize your hard disks; and use Wipe Info to create your own Wipe Info Trash icon, which will let you "shred" your confidential documents.

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4-3 Using Directory Assistance II worksets
4-4 Setting up Directory Assistance II
4-6 Creating a workset
4-8 Automatically selecting a workset for your application
4-8 Managing your File and Folder menus
4-10 Customizing your Directory Assistance II menus
4-11 When you have finished
4-11 Using the Norton Utilities' Get Info
4-14 Using Norton Partition
4-14 About Disk Partitioning
4-15 Creating a partition
4-19 Modifying an existing partition
4-21 Mounting a partition
4-22 Unmounting a partition
4-23 Deleting a partition
4-24 Creating a Wipe Info Trash icon

Using Directory Assistance II worksets

You can think of a workset as a kind of "super folder" that gives you direct access to a group of files and folders, regardless of where they are stored on a disk. For example, your word processing, spreadsheet, and project management documents may be located in three separate folders, but you could add the names of documents from each folder to a single workset. Using that workset, you could open any of the documents without having to switch folders.

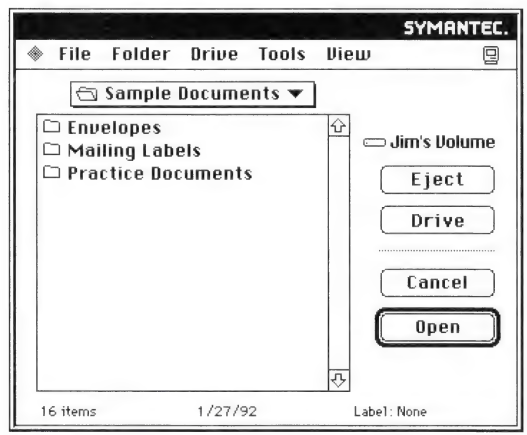
Directory Assistance II (DA II) comes already set up with the Universal Workset. As discussed in Chapter 3, "Performing Everyday Operations," you can take advantage of the basic features of worksets without having to learn much about them. But as you will see, with just a little more effort, you can easily take advantage of the more advanced uses of a workset. You can create custom worksets for individual application programs, for specific projects, or you can create your own "universal" workset.

Before you use this section, you should be familiar with the basic features of Directory Assistance II. For more information see Chapter 3, "Performing Everyday Operations."

The Directory Assistance II menu bar, as shown in Figure 4-1, appears at the top of any Open or Save As dialog box.

Figure 4-1

Open dialog box with Directory Assistance II active



The File, Folder, and Drive menus are used to choose items whose information is stored in a workset. The Workset menu lets you create, choose, and configure worksets. The DA II (◈) menu contains commands that specify how Directory Assistance II should work generally and with specific programs.

Setting up Directory Assistance II

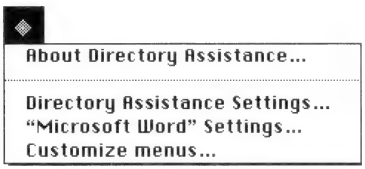
Before you create a workset, check to see that Directory Assistance II is set to work the way you would like. These settings remain active no matter which workset you use.

› **To change Directory Assistance II settings:**

1 Open the application program for which you want to create a workset.
If you are creating a workset to use with more than one application, it doesn't matter which application you open.

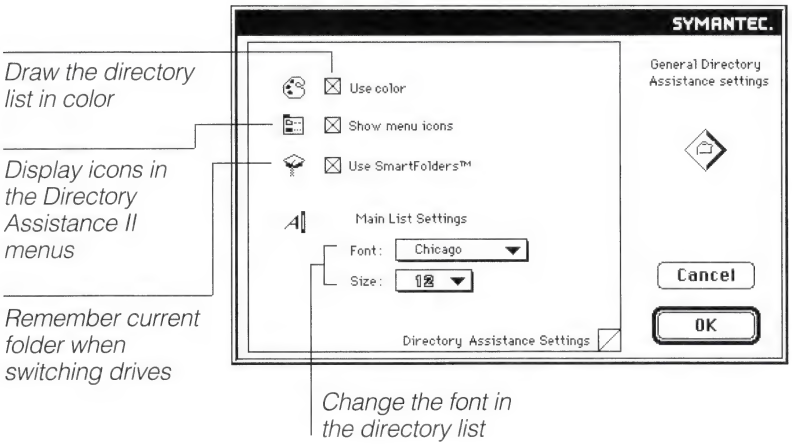
2 Choose Open from the File menu.
The directory dialog box appears. See Figure 4-1 for a typical example.

3 Choose Directory Assistance Settings from the DA II ◈ menu.



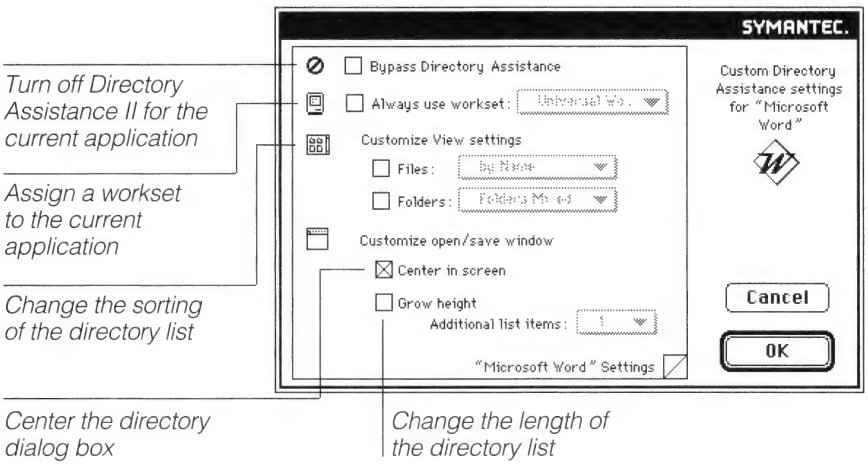
The Settings dialog box appears, open to the Directory Assistance Settings page. (Figure 4-2.)

Figure 4-2
Directory Assistance Settings



4 Select the desired settings.
Consult the *Reference* for more information on the settings.

5 If you want to change settings for the current application, click the page corner.
The Settings page for the current application program appears.



6 Click OK.
You will return to the directory dialog box.

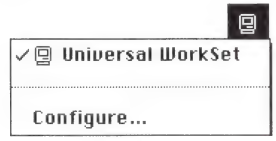
Creating a workset

You can create a custom workset that will let you access the file and directories you use most frequently and will display them in the way that you prefer.

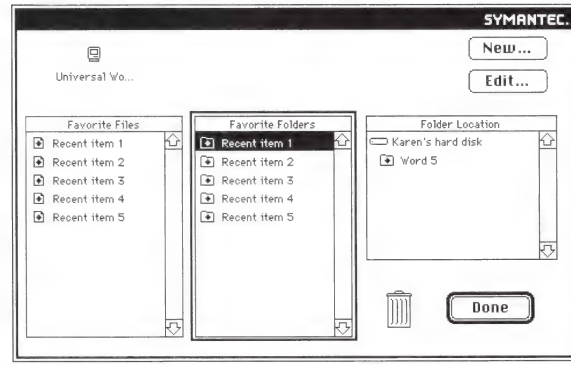
› To create a new workset:

The current application program should be the one for which you want to create the workset.

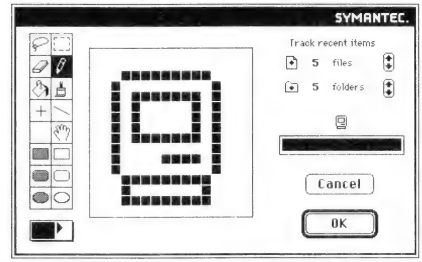
1 Choose Configure from the Workset menu.
The Workset menu appears at the far right side of the Directory Assistance II menu bar. The icon for the Universal Workset is a small Macintosh. You can customize the icon for each workset.



The Workset Configuration dialog box appears.



2 Click New.
The New Workset dialog box appears.



3 Type a name for the workset.

The text box is selected, and the name of the current application program appears. If you want to change the name, begin typing.

You can also edit the icon for the new workset if you wish. For information on the icon editing tools, see the "Get Info" section of "Fast Find" in the *Reference*. The only difference between creating a workset icon and a file icon is that the workset icon is black and white only. None of the color tools are available for workset icon editing.

4 Set the number of recent files and folders to track.

Each time you open or save a document to a new name, Directory Assistance II adds the name of the file and its folder to the File and Folder menus, respectively. Directory Assistance II will track up to 35 filenames and 35 folder names.

5 Click OK when you've finished.

The Workset Configuration dialog box appears.

The new workset appears in the list of worksets.

6 Click Done.

You will return to the directory dialog box. The new workset is now active.

The icon for the new workset appears in the menu bar.

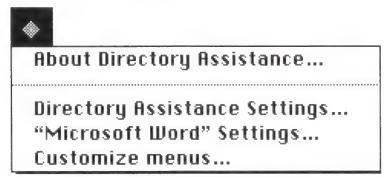
Automatically selecting a workset for your application

You can specify which workset should be used when you open an application. This is helpful if you always use the same files, folders, and drives with a specific application. You also can assign the same workset to more than one application.

› **To assign a workset to an application:**

The current application program should be the one to which you want to assign the workset.

1 Choose "Your Application" Settings from the DA II ◈ menu.



The name of the current application program appears as the next-to-last item in the list of commands.

The Settings dialog box appears.

2 Click the Always use workset checkbox.
From the pop-up menu, select a workset. (You can change other settings if you wish; consult the *Reference* for more information.)

3 Click OK.
You will return to the directory dialog box.

Managing your File and Folder menus

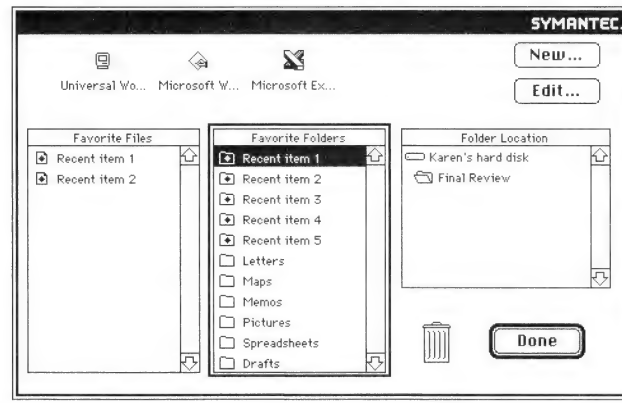
As you work, you will find that your lists of files and folders can grow quite long. You may wish to reorganize a list by moving items up or down; or you may want to delete an item that is no longer needed.

› **To reorder the items in the File and Folder menus:**

1 Open any application program.
If you want to modify the workset assigned to an application, open that application.

2 Choose Open from the File menu.
The Open File dialog box appears.

3 Choose Configure from the File, Folder, or Workset menus.
The Workset Configuration dialog box appears.



4 If the workset you want to modify is not selected, click its icon.

5 Position the pointer over the file or folder you wish to move.
The pointer turns into a hand. If you are not sure that this is the item you want to move, you can click its name, and its location on your disk appears in the Folder Location list.

6 Drag the item to a new position in the list.

7 Click Done.
You are returned to the directory dialog box. The changes will appear in menu that was modified.

› **To delete items in the File and Folder menus:**

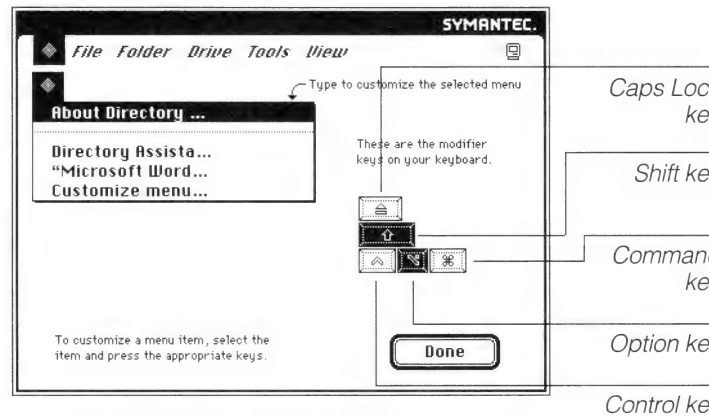
- **Select the item you want to delete, then drag it to the Trash.**

Customizing your Directory Assistance II menus

After you become familiar with the Directory Assistance II, you can use it even more quickly by assigning keyboard shortcuts to Directory Assistance II menu commands and file, folder, and drive names. For example, you can switch to a favorite folder by typing its keyboard shortcut keys.

› **To create keyboard shortcuts for Directory Assistance II menu commands:**

1 Choose Customize Menus from the DA II ◈ menu.
A dialog box appears.



2 Click the name of the menu.
A picture of the menu appears.

3 Click the command name to which you want to add a keyboard shortcut.

4 Press the keys that you wish to use as the keyboard shortcut.
You must use a combination of at least one modifier key—Caps Lock, Shift, Control, Option, or Command key—with any letter or number key.

If the same keyboard shortcut is being used elsewhere in the Directory Assistance II menus, an alert box will

warn you that there is a conflict. If you want to remove a keyboard shortcut, press the Space bar.

5 Repeat steps 2 through 4 for each keyboard shortcut you wish to add.
Each time you change menus, DA II saves any keyboard shortcuts you typed.

6 Click the Done button.
You will return to the directory dialog box. You can use the keyboard shortcuts right away.

When you have finished

DA II saves your changes as you make them. When you have finished making changes to your workset, close your application's directory dialog box as usual, or you can click Cancel to save changes to DA II without using the directory dialog box.

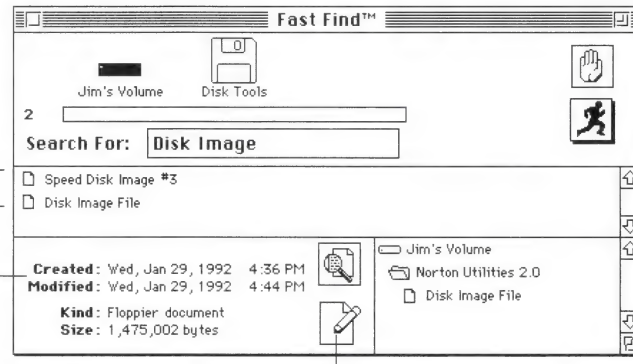
Using the Norton Utilities' Get Info

Before you use this section, you should be familiar with the basic features of Fast Find. For more information, see Chapter 3, "Performing Everyday Operations."

The Get Info command gives you information about a selected document or application. You can flip between three "pages" of information. You can see general information similar to that shown by the Get Info command in the Finder's File menu; more esoteric information such as the file's type and creator codes, and its Finder attributes; or you can even edit the file's Finder icon.

1 Use Fast Find to locate the file that you wish to modify.

2 Click the name of the file to select it.

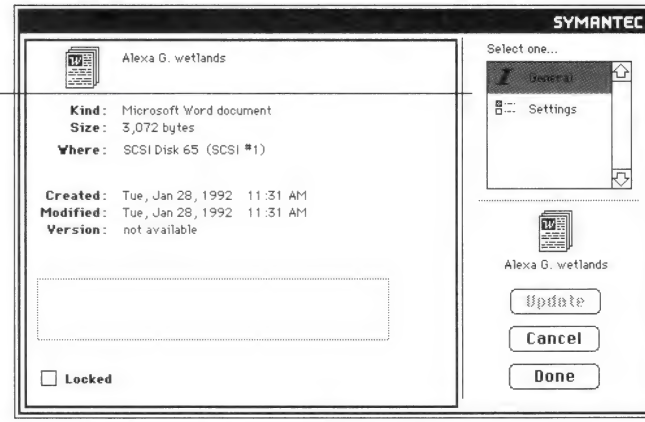


Click to select a file

Double-click to go directly to the Get Info Settings page

Double-click to go directly to the Get Info Icon page (System 7)

3 Choose Get Info from the Fast Find menu.
A dialog box appears.



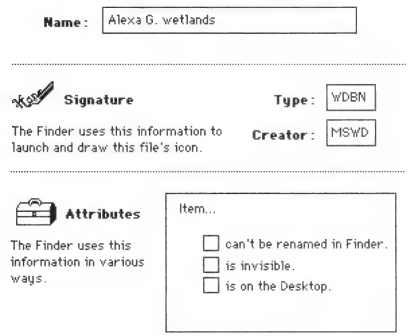
Select the type of information to be displayed

A list of the types of information that you can view is displayed in the upper-right portion of the dialog box. When you click any of these choices, the Get Info dialog box changes to show the information you requested.

General Settings is automatically selected. The information displayed is similar to the standard Finder Get Info window.

4 Click Settings to see the file's Finder attributes.

You can change the name of the file, its type and creator, and its Finder attributes.



Changing a file's creator or type codes can prevent its native application from opening it. Don't change these codes unless they are incorrect and you know the correct codes. See your application program manual for the correct codes.

To change Finder attributes, click the appropriate checkboxes. The attributes for System 6 and 7 are different. For more information on Finder attributes, refer to the chart in "Norton Disk Editor" in the *Reference.*

5 Click Icon to view or edit the file's Finder icon.

In System 7, you can copy an icon from a graphics program and paste it to an icon's Info window. Using Fast Find, you can create custom icons for your files and disks.

See on-line help for details on editing an icon.

Generally, you must restart your Macintosh before you'll see changes to a file's icon in the Finder or elsewhere. If the file's icon hasn't been displayed since you last started (if the file is in a folder you haven't opened, for instance), then changes to the icon will appear immediately.

6 Click Update to save any changes.

Using Norton Partition

About Disk Partitioning

Not too long ago, a hard disk that held 40 megabytes of information was considered a "high capacity" hard disk. These days 170 megabytes of disk storage hardly seems enough when you are an active user. As you add more and more files to a single volume, it can become sluggish and overburdened. It may become increasingly difficult to locate files quickly. Managing a disk that contains this much information can be a demanding task.

One solution is disk partitioning. Your Macintosh usually sees a SCSI hard disk as a single volume partition. When a disk is partitioned it is subdivided, allowing each part to act as an independent volume. In this way, a 100 megabyte drive might have two volume partitions, 50 megabytes each, and you see two separate volume icons on the desktop. You can move current work to one of the volumes and put infrequently used files on another volume that doesn't even appear on the desktop.

There are two techniques for partitioning SCSI disk drives. The preferred method is called "hard partitioning". When a drive is hard partitioned, each partition appears as an independent volume with its own boot blocks and volume information block. When the Macintosh sees a structure like this, it recognizes and treats the volume partition as if it were an independent drive. While this approach is probably the more dependable and problem free way to partition a hard disk, it is not the most flexible or convenient method.

Soft partitioning, like that supplied by Norton Partition, provides both flexibility and convenience. It can improve your overall drive performance, file management, and data security. This method usually is managed by a startup document (INIT) in conjunction with a desk accessory, rather than the device driver used in hard partitioning. For each soft partition, an invisible file is created and stored on the "parent" volume. This file contains the partition's vital information, such as its location, size and whether it is displayed on the desktop at startup time.

Norton Partition can create partitions that can be:

- expanded as needed
- cached for faster access
- read only
- encrypted so only those with the correct password have access

Norton Utilities for Macintosh provides support from other utilities to enhance Norton Partition, for example:

- If a partition is encrypted, you can back up the contents of the partition and the partition data file using Norton Backup, then encrypt the Backup set using Norton Encrypt to ensure security.
- Disk Doctor, Volume Recover, and UnErase all include special support for repairing or recovering information from a damaged or lost Norton volume partition.

There are five main tasks that you'll use Norton Partition for: creating a partition, modifying an existing one, mounting a partition (making it appear on the desktop), unmounting a partition, and deleting a partition.

Creating a partition

A partition that is created on an unfragmented hard disk will be faster to use than one created on a fragmented hard disk. First, use Norton Disk Doctor to verify that there are no problems with your disk. Next, use Speed Disk to check and, if necessary, optimize your hard disk. For information on Speed Disk, see Chapter 5, "Optimizing a Disk."

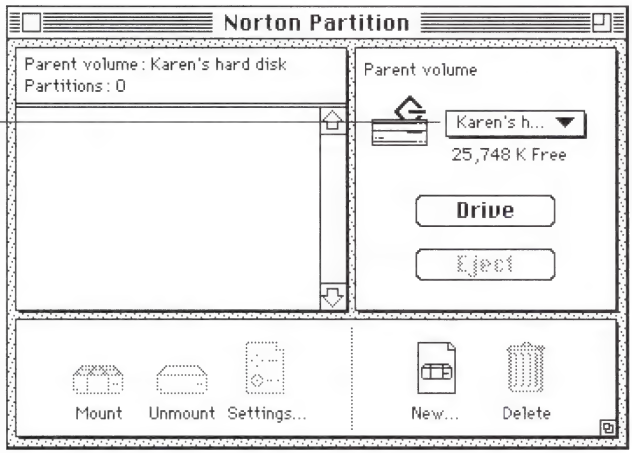
1 Choose the Norton Partition desk accessory from the Apple menu.

The Norton Partition window appears.

If you haven't made Norton Partition an Apple Menu item, you can open it by double-clicking the Norton Partition icon in the Norton Utilities folder.

Figure 4-3

Norton Partition main window



Volume selection pop-up menu

2 From the pop-up menu, choose the volume on which you want to create the partition.

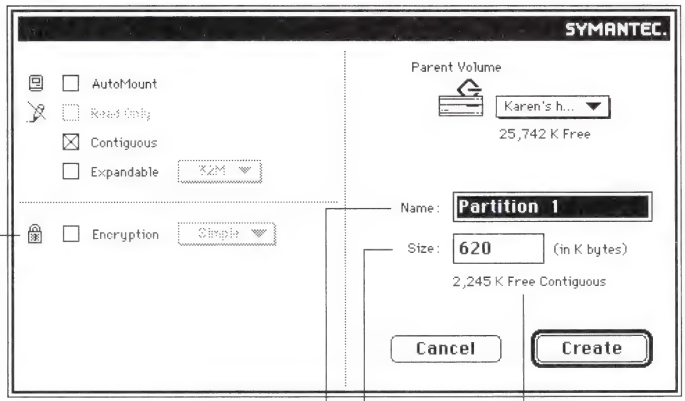
New...

3 Click the New button.

The New Partition dialog box appears. This dialog box has all the controls you use to set up your new partition.

Figure 4-4

Norton Partition New dialog box



Options

Encryption method

Name of the partition

Size of the partition

Contiguous space available on volume

4 Type the name of the new partition.
Because the Name text box is already selected, all you have to do is start typing.

5 Type the size of the partition.
Be sure to see how much room you have available before you specify how large the partition must be.

6 Select the options you want.

Automount: The partition will appear on your desktop every time you start your Macintosh from this particular hard disk (the one containing the partition). Otherwise, you must use the Norton Partition desk accessory to make the partition available.

Contiguous: The partition will occupy a single chunk of disk space, without gaps. You can click this option to uncheck it, but a discontinuous partition is slower to use. Also, in the event of a problem, a contiguous partition is easier to recover.

Expandable: If this option is selected, you can change the size of the partition after the partition is created. When you check this option, you must choose the maximum expansion size from the pop-up menu.

7 To secure the partition, click the Encryption checkbox, then choose the type of encryption from the pop-up menu.
The types of encryption available are listed in order of complexity. See "Norton Encrypt" in the *Reference* for more information about the encryption methods.

Before you can provide password protection for an encrypted volume, the "Allow user to create private partitions" checkbox must be checked in the Advanced Options dialog box. You access this dialog box by choosing the Advanced Options command from the Partition menu. This menu is not available while you're creating a partition.

You can encrypt a partition at a later date, too, if you wish. See Chapter 6, "Data Security," for more information.

8 Type a password for the partition.

You will be prompted to type the password each time that the partition is mounted or accessed through Norton Partition.

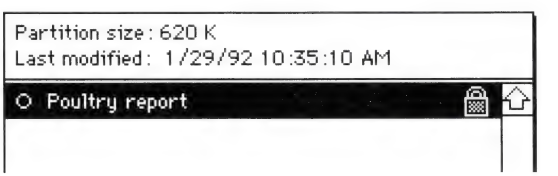
Leave the Emergency Access checkbox checked. If you forget your password, you can only get to the partition if you have set up Norton Partition to use its Advanced Options and the Emergency Access checkbox is selected. See "Norton Partition" in the *Reference* for more information.

9 Click Create to create the partition.

You'll return to the Norton Partition main window. Notice that the new partition's name has been added to the scrolling list at the window's left.

Figure 4-5

New partition added



Your new partition appears on the desktop and is ready for use.

10 Click the close box on the main window to exit Norton Partition.

Modifying an existing partition

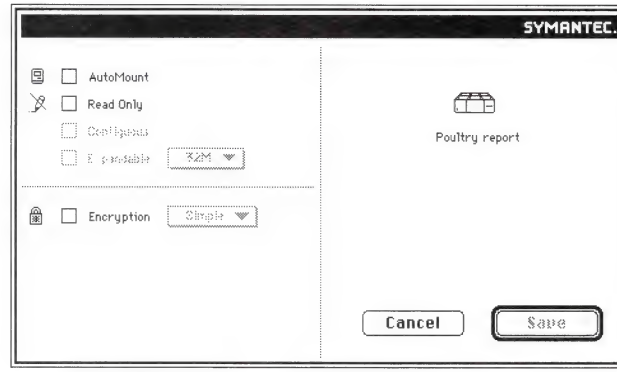
You can change some of the settings that were selected when the Partition was created. In addition, you can protect the partition from being written to or modified.

1 Choose the Norton Partition desk accessory from the Apple menu.
The Norton Partition window appears.

2 Select the volume containing the partition you want to change.
You can also click the volume icon to cycle through the selections.

3 Select the partition you want to modify.
The partition must be unmounted before you can modify its settings.

4 Click the Settings button at the bottom of the window.
The Partition Settings dialog box appears.



5 Make the desired changes in the dialog box.

Automount: The partition will appear on your desktop every time you start your Macintosh from this particular hard disk (the one containing the partition). Otherwise, you must use the Norton Partition desk accessory to make the partition available.

Read Only: Documents in the partition can be opened, but not altered. No documents can be written to (saved onto) the partition. This feature is especially useful on a network where you may want to share information but don't want it altered.

Encryption: Choose the type of encryption you want from the pop-up menu.

Size: This option only appears if you made the partition's size expandable when you first created it. Type in a number that is less than or equal to the number that appears in the Expandable pop-up menu.

6 Click Save to put the changes into effect.

7 Click the close box on the main window or choose Quit from the Partition menu to exit Norton Partition.

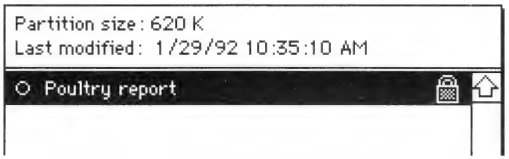
Mounting a partition

Before you can use a partition, it must be mounted; that is, made available on the desktop. If you chose the Automount option when you created the partition, then it will mount every time you start up your Macintosh from the hard disk containing the partition. Otherwise, you must mount the partition manually.

1 Choose the Norton Partition desk accessory from the Apple menu.
The Norton Partition window appears.

2 From the pop-up menu, select the volume containing the partition you wish to mount.
You can also click the volume icon to cycle through the selections.

3 Select the partition you want to mount.



4 Click the Mount button.
If the partition is encrypted, you will be prompted to type your password.

5 Click the close box or choose Quit from the Partition menu to exit Norton Partition.
The partition will be mounted, ready for use.

Unmounting a partition

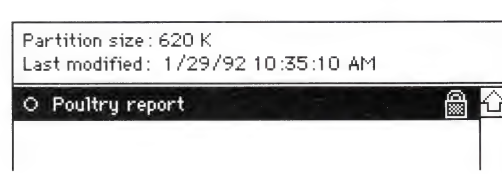
When you finish working with a partition, you may want to put it away. This keeps your desktop from getting too cluttered. It also saves memory. From the desktop, the easiest way to unmount a partition is simply to drag it to the Trash.

The most common reason for unmounting a partition within the Norton Partition desk accessory is to edit the partition's settings. The procedure for unmounting a partition is similar to that for mounting one.

1 Choose the Norton Partition desk accessory from the Apple menu.
The Norton Partition main window appears.

2 Select the volume containing the partition you wish to unmount.
You can also click on the icon to cycle through the selections.

3 Select the partition to unmount.



4 Click the Unmount button.
The partition will disappear from the desktop.

5 Click the close box or choose Quit from the Partition menu to exit Norton Partition.

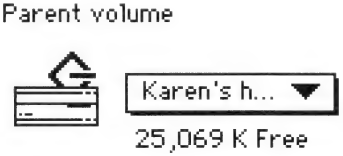
Deleting a partition

Sometimes partitions outlive their usefulness, particularly when they were created to hold data associated with some temporary project. It's easy to delete a partition that you no longer need.

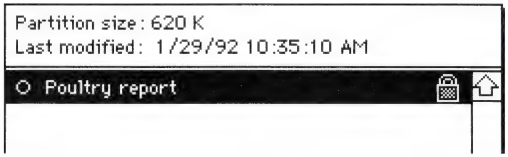
Make sure that you don't have any valuable data on a partition that you intend to delete. Once you delete the partition, the data will be gone for good. A partition must be unmounted before you can delete it.

1 Choose the Norton Partition desk accessory from the Apple menu.
The Norton Partition window appears.

2 Select the volume containing the partition you wish to delete.
You can also click the volume icon to cycle through the selections.



3 Select the partition you want to delete.
Click its name to select it.



Delete

4 Click the Delete button.
A dialog box will appear, asking you to confirm that you want to get rid of the designated partition.

5 Click the close box on the main window or choose Quit from the Partition menu to exit Norton Partition.

Creating a Wipe Info Trash icon

If you handle a lot of confidential material, you might want to create a Wipe Info Trash icon. It stays on your desktop, just like your regular Macintosh Trash icon. You drag files to it just as you do to the regular Trash. You can also double-click it to start Wipe Info.

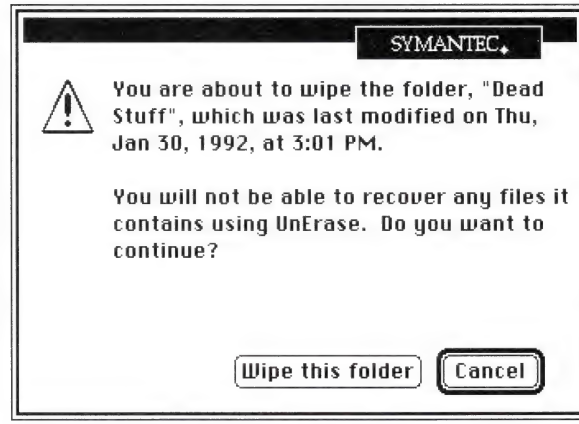
› **To create a Wipe Info Trash icon:**

1 Start Wipe Info.
The Wipe Info window appears.

2 Choose Create Wipe Info Trash from the Options menu.

Wipe Info creates a Trash icon on the lower left of your desktop; it doesn't affect your Macintosh Trash at all. Now you can use it to erase data.

3 To erase a file or folder permanently, drag it to the Wipe Info Trash.
Wipe Info starts and warns that you are about to erase the data permanently and won't be able to bring it back.


SYMANTEC.
You are about to wipe the folder, "Dead Stuff", which was last modified on Thu, Jan 30, 1992, at 3:01 PM.
You will not be able to recover any files it contains using UnErase. Do you want to continue?
Wipe this folder
Cancel

4 Click the Wipe This File (or Folder) button.
Wipe Info erases the file or folder permanently and quits automatically.

- To remove the Wipe Info trash can, just drag it to the Macintosh Trash on your desktop.
- For more information on Wipe Info, see the "Wipe Info" in Part II, *Reference*.

CHAPTER 5

Optimizing a Disk

Contents

5-4 Analyzing your hard disk
5-5 Defragmenting files
5-5 Optimizing a hard disk

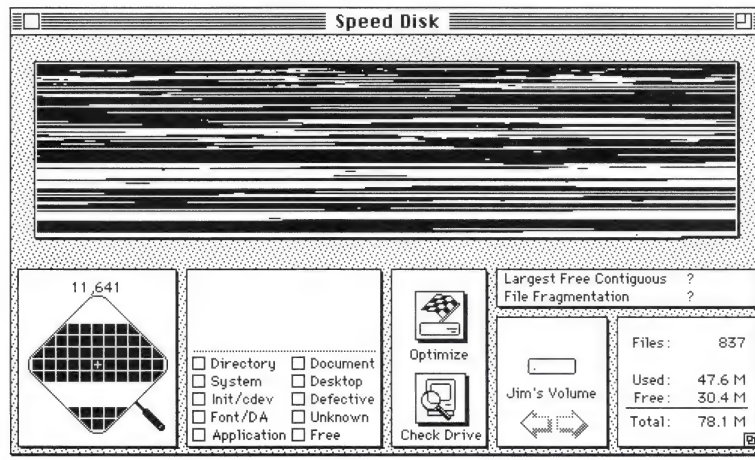
As you create, change, and delete files on your hard disk, pockets of empty space build up. This is called *disk fragmentation*. If your Macintosh can't find enough space to store a file in one location, it will divide the file up and store it in two or more places. This is called *file fragmentation*. Fragmentation slows down your disk access time while your application searches for the parts of a fragmented file. Fragmentation can also encourage disk and file saving/reading errors.

Speed Disk analyzes your hard disk for disk and file fragmentation, reports on the location of your files, and recommends appropriate action. The you can choose either to optimize your hard disk or to defragment files.

- *Before using Speed Disk to optimize your hard disk, make sure it has been securely backed up.*
- *Always use Norton Disk Doctor to diagnose your disk before you run Speed Disk.*
- *If you're using a security program like Disk Lock, make sure you deactivate it before running Speed Disk.*

Figure 5-1

Speed Disk window



Analyzing your hard disk

› **To analyze your hard disk without making changes:**

1 Start Speed Disk by double-clicking the Speed Disk icon in the Norton Utilities 2.0 folder.
If you're already in Norton Utilities, and working from your hard disk, choose Speed Disk from the Utilities menu. The Speed Disk window appears.

Do not try switching to Speed Disk if you are using the Emergency Disk; the Emergency Disk contains only the Norton Utilities.

Drag the icon of the disk you wish to optimize onto the Speed Disk icon. Speed Disk starts analyzing the chosen disk.

2 Click the Check Drive button.
Speed Disk starts analyzing your disk. The progress bar indicates Speed Disk's activity as it examines files. When it is finished, you see a comment in the message area on the right.

3 Note Speed Disk's comments in the message area on the right.
Speed disk reports the amount of fragmentation and suggests whether to optimize.

Largest Free Contiguous	6.5 M
File Fragmentation	0.07%

To take a closer look at the organization of files on your hard disk, choose Go To Expert from Speed Disk's Options menu. See the Reference section for more details.

4 To quit Speed Disk, choose Quit from the File menu.
You quit Speed Disk and the Norton Utilities.

You can also choose another utility from the Utilities menu. If you want to continue and defragment files or optimize your hard disk, read on.

Defragmenting files

If optimizing your hard disk is inconvenient, you can defragment files. While you must use another startup disk when you optimize, you can use your startup volume to defragment files on that volume.

› **To defragment files:**

Optimize

1 Click the Optimize button.
Speed Disk examines your disk, and tells you it can't optimize, and asks if you would like to defragment files.

2 Click the Defragment Files button.

You can watch Speed Disk's progress as it defragments files.

When finished defragmenting, Speed Disk shows a list of open files that couldn't be defragmented. This usually includes the System file, and whatever other files you have open.

3 Click Done.
You return to Speed Disk.

4 Choose Quit from the File menu.
This quits Norton Utilties.

- To stay in Norton Utilties, make another choice from the Utilities menu.
- To optimize your hard disk, read on.

Optimizing a hard disk

If you're running Norton Utilities from your startup hard disk, you must start from Norton Application Disk 1 to optimize it. If you're optimizing any other disk, you don't have to start from the Norton Applications Disk 1. Just follow the instructions from step 2.

Make sure you've backed everything up before you do this–just to be safe, and that you've turned off any security programs you have installed.

› To optimize your hard disk:

Do not try switching to Speed Disk if you are using the 800K Emergency Disk; the Emergency Disk contains only the Norton Utilities.

1 Start your Macintosh with Norton Application Disk 1.
You see the Speed Disk icon in the Finder window.

2 To start Speed Disk, double-click its icon.
The Speed Disk window appears. Make sure Speed Disk is set to optimize the correct disk.

3 Click the disk selection arrows until the correct drive name appears.
If the correct drive name is already there, you don't have to click the arrows.

4 Click the Check Drive button to read in information about your drive.
Speed Disk examines your drive, determines how fragmented it is, and gives a diagnosis.

```
Slight fragmentation. Optimize for
nominal speed gain.
```

5 Click the Optimize button.
Speed Disk will take from less than one to more than 30 minutes to optimize your disk, depending upon the disk's size and condition. When Speed Disk successfully optimizes the disk, it returns to its "ready" state. The message area reads:

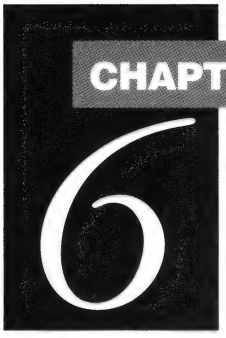
```
No need to optimize - this disk is in
great shape!
```

6 To quit Speed Disk, choose Quit from the File menu.

Because you're working from the Norton Application Disk 1, you are prompted to restart your system, which will start from your newly optimized hard disk.

Speed Disk recommends that you rebuild your desktop at this point. If you don't know how to rebuild your desktop, see your Macintosh system manual for more information.

For more information on the advanced features of Speed Disk in the Expert mode, see the Reference section.



Data Security

As well as keeping your data safe through regular use of Norton Utilities, you may need to keep it secure from unauthorized access. The procedures in this chapter show you how to protect files, folders, and partitions with encryption and password access, and how to make sure confidential data can't be unerased.

Contents

6-3 Encrypting Files with Norton Encrypt
6-7 Making a Partition Secure
6-11 Deleting a file forever
6-14 Erasing a Disk
6-15 Erasing a disk's free space

Encrypting Files with Norton Encrypt

Norton Encrypt "scrambles" data—a single file or the files within a folder—using a password that you provide (and must remember!). When you want to use an encrypted document or folder, you can double-click its icon on the desktop just as you would normally do to open it. Encrypt will start and you'll be asked to give the password necessary to decrypt the selected file or folder. You can then work with the document or folder normally.

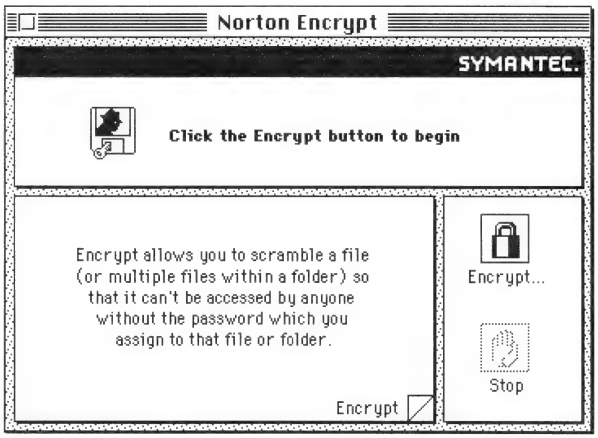
› **To encrypt a file or contents of a folder:**

Norton Encrypt

1 Start Norton Encrypt by double-clicking its icon.

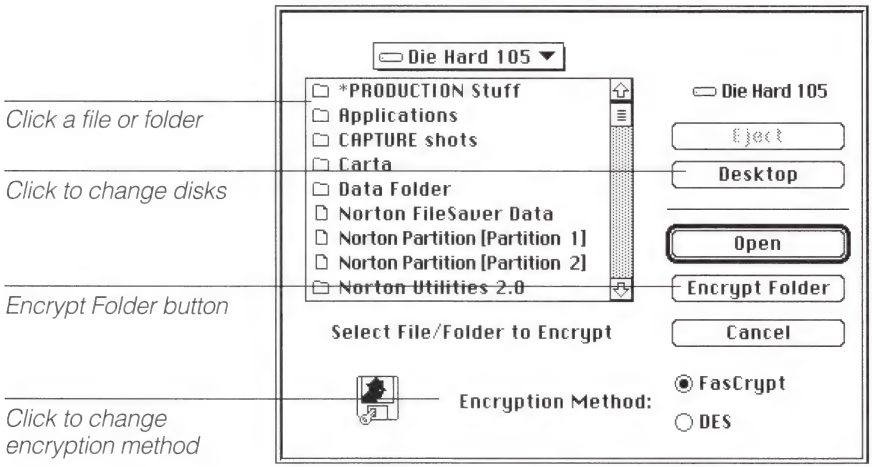
You can drag the document icon to the Norton Encrypt program icon and skip to step 5.

The Norton Encrypt window appears.


Norton Encrypt
SYMANTEC.
Click the Encrypt button to begin
Encrypt allows you to scramble a file (or multiple files within a folder) so that it can't be accessed by anyone without the password which you assign to that file or folder.
Encrypt...
Stop
Encrypt

2 Click the Encrypt button in the Norton Encrypt window.
A dialog box appears where you select the file or folder whose contents you want to encrypt.

3 In the scroll list, select the file or folder you want to encrypt.



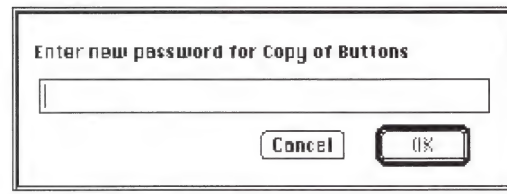
If you wish, you can select a different encryption method. See the Norton Encrypt Reference section for details.

4 Click the Encrypt File or the Encrypt Folder button.

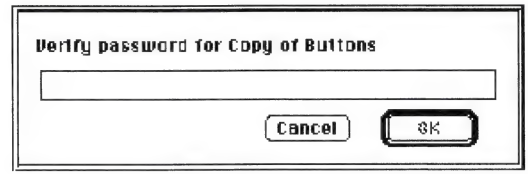
What shows up depends on whether you select a file or folder.

5 Type a password, then click OK.

Be sure to remember your password. Norton Encrypt asks you to type it again, in case you make a typing error.

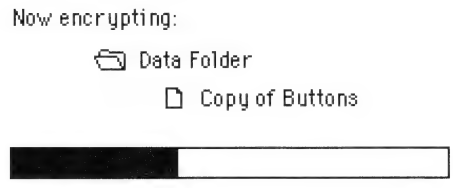


6 Type the new password again to verify it, then click OK.



Norton Encrypt starts encrypting the file or folder you selected. You're kept informed with a progress bar showing the file or folder and its location on your disk.

Encrypting a folder encrypts the contents of the folder, not the folder itself.

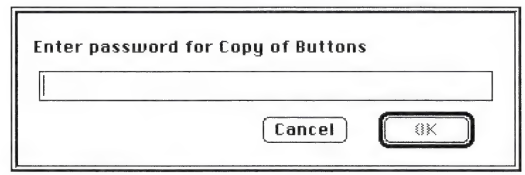


7 To encrypt more files or folders, click the Encrypt button again.
Repeat steps 3–7 to select and encrypt files or folder contents.

8 When you've finished encrypting, click the close box on the main window, or choose Quit from the File menu.

› **To decrypt a file quickly:**

1 Double-click the encrypted file's icon on the desktop. Norton Encrypt starts automatically and asks you for the password that you assigned earlier.

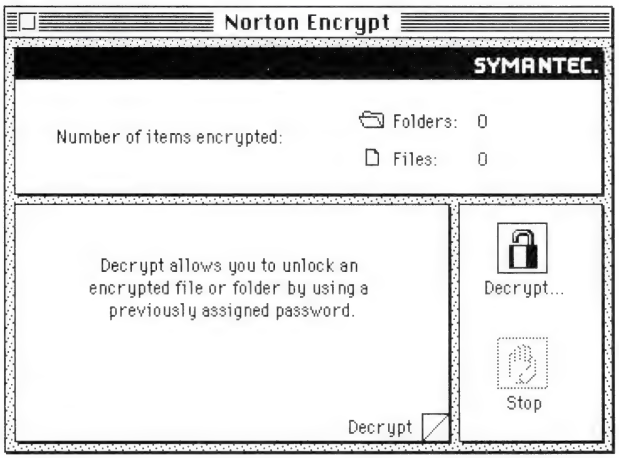


2 Type the password, then click OK.
The file is decrypted and Norton Encrypt quits automatically.

› **To decrypt several files or folders' contents:**

1 Start Norton Encrypt by double clicking its icon.
You see the Norton Encrypt window.

2 To switch to the Decrypt layer, click the dog ear at the bottom of the Norton Encrypt window.
The Decrypt layer of the window appears.



3 Click the Decrypt button.
A dialog box appears where you select the file or folder you want to decrypt.

4 Select the file or folder and click the Decrypt file or Decrypt Folder button.
Norton Encrypt decrypts the file or contents of the folder you selected. You're kept informed with a progress bar.

5 To leave Norton Encrypt, click the close box or choose Quit from the File menu.

7 Create an alias of Norton Encrypt and leave it on your desktop. When you want to encrypt a file, just drag its icon to the Encrypt alias icon. Norton Encrypt will ask you for a password, encrypt the file, and close.

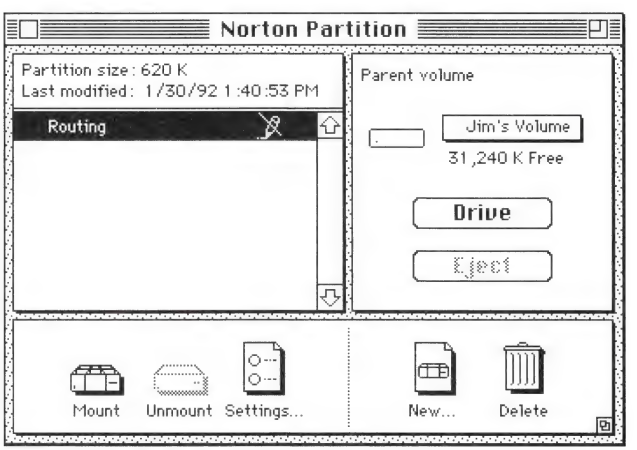
Making a Partition Secure

You can add encryption with password protection to safeguard the contents of a partition. You can also make a partition read-only (that is, you'll be able to read its contents, but not save changes). Both procedures are briefly described here.

For further information on *creating* partitions, see Chapter 4, "Customizing Norton Utilities," and "Norton Partition" in Part II, *Reference*. If you're a network administrator and want to use special advanced options, see Appendix D, "Guide for the Network Administrator."

› **To add password protection to an existing partition:**

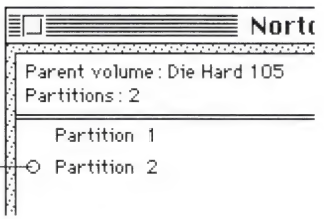
1 Choose Norton Partition from the Apple menu.
The Partition window appears. You see the names of partitions you've set up.



2 To select the partition, click its name.

Unmount

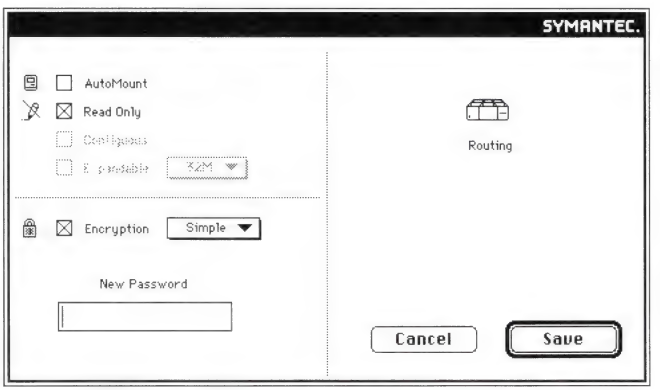
3 If the partition you selected in step 4 is mounted, click the Unmount button.
You can tell a mounted partition, that is, one that is active on the desktop, by the small circle beside it.



Mounted partition

Settings...

4 When the selected partition is unmounted, click the Settings button.
The Settings dialog box appears. On the left is the Encryption checkbox.

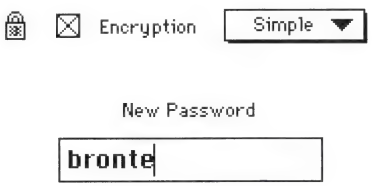


5 Click the Encryption checkbox to select it.
A checkmark appears in the box.

6 Choose an encryption type from the popup menu.
The encryption type is preset to Simple.

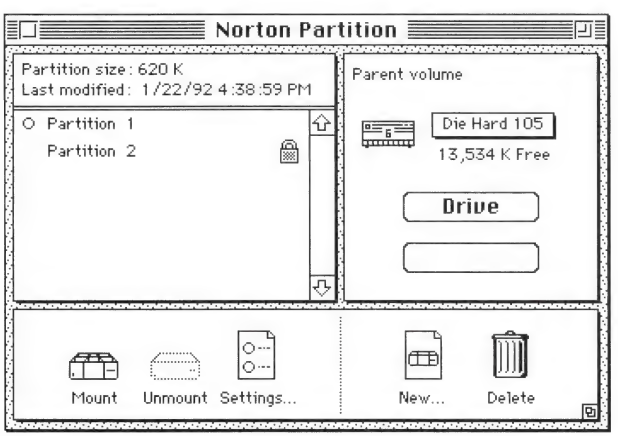
Choices are Simple, Complex, FasCrypt, and DES. For more information on these encryption methods, see the Norton Encrypt and Norton Partition Reference sections of this manual.

7 Type a password in the New Password text box.
Your password must be between four and fifteen characters. If you type fewer or greater, you'll get an error message.



DO NOT forget your password. Once you've assigned password protection to a partition, you must use the password to mount the partition or change its settings. Unless you have set up Emergency Access prior to creating the partition, there is no other way to access the partition's settings if you forget your password; you'll have to create a new partition. For information on Emergency Access, see Appendix D, "Guide for the Network Administrator."

8 Click OK.
Norton Partition assigns password protection to the partition you selected. It sounds a chord when it's finished. You return to the Norton Partition window.



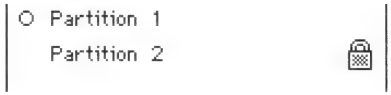
If you don't want to mount the partition at this time, you can exit from Norton Partition.

9 Choose Quit from the Partition menu.
To mount the partition you've protected, read on.

Once you've assigned a password to a partition, you'll need to enter the password to mount or unmount the partition, or to change any other settings.

› **To mount a protected partition:**

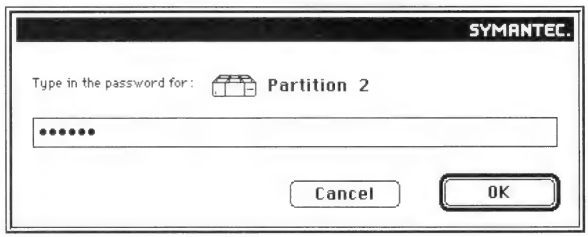
1 In the Norton Partition window, select the partition you want to mount.



Mount

2 Click the Mount button.
You're asked to type the partition's password.

3 Type the password you assigned to this partition, and click OK.



The partition is mounted, and you see its icon on the desktop. You can leave Norton Partition at this point.

4 To leave Norton Partition, click the close box, or choose Quit from the Partition menu.

You can encrypt the entire contents of a partition. To do so, see the previous section on encrypting files and folders, and follow the same steps as you would for encrypting the contents of a folder.

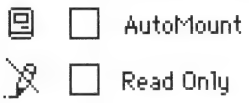
› **To make a partition read-only:**

1 **Start Norton Partition.**
The Norton Partition window appears.

2 **Select the partition you want to make read-only.**
Make sure it isn't mounted. You can't change a partition's settings unless it is unmounted.

3 **Click the Settings button.**
The Settings dialog box appears.

4 **Click the Read Only checkbox to select it.**



5 **Click Save.**
Norton Partition changes the partition to read only and sounds a chord when finished. You return to the Norton Partition window. You can check to see that the read-only icon (that is, a pencil with a backslash through it) is opposite the selected partition.

6 **To leave Norton Partition, click the close box or choose Quit from the Partition menu.**

For more information about Norton Partition, see Chapter 3, "Customizing Norton Utilities."

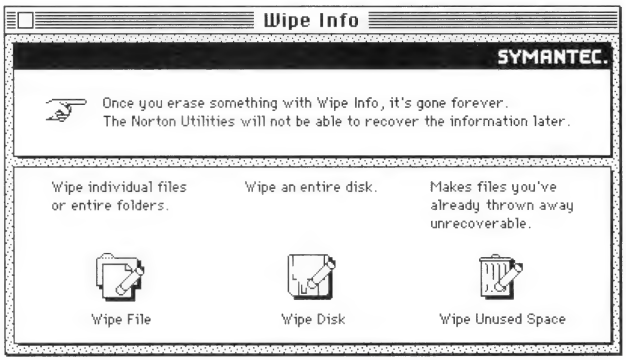
Deleting a file forever

When you delete a file the "regular" way, such as dragging it to the trash, you really only remove the file's name from the directory of the disk where it is located. You do not delete the file's actual data. It stays on the disk unchanged until part or all of it is overwritten by something else. Often you can bring back this data using Norton UnErase, or find and view the file contents using Norton Disk Editor.

If you have confidential or sensitive data, you probably want to make sure that it's really gone.

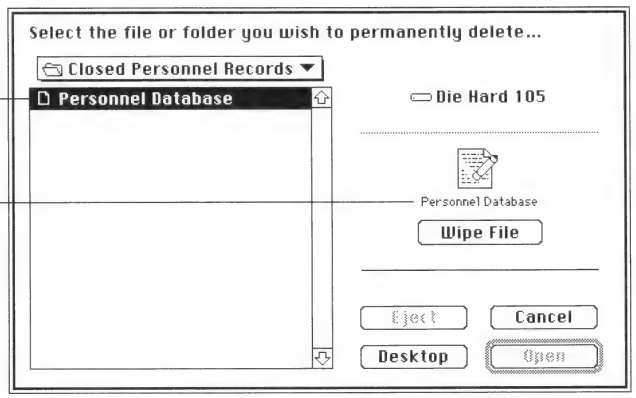
› **To delete a file and its data *permanently*:**

1 Double-click the Wipe Info icon in the Finder.
The Wipe Info window appears.


Wipe Info
SYMANTEC.
Once you erase something with Wipe Info, it's gone forever.
The Norton Utilities will not be able to recover the information later.
Wipe individual files or entire folders.
Wipe an entire disk.
Makes files you've already thrown away unrecoverable.
Wipe File
Wipe Disk
Wipe Unused Space

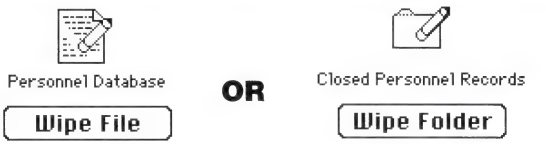
While on the desktop you can drag a file's or folder's icon directly to the Wipe Info icon to delete the file. Wipe Info will start and you can proceed to step 4. If you want to bypass Wipe Info's confirmation dialog box, hold down the Option key as you drag the file icon to the Wipe Info icon. You may also want to create a Wipe Info trash. See Chapter 4, "Customizing Norton Utilities" for more information.

2 In the Wipe Info window, click the Wipe File button.
A dialog box appears where you select the data you want to delete permanently.

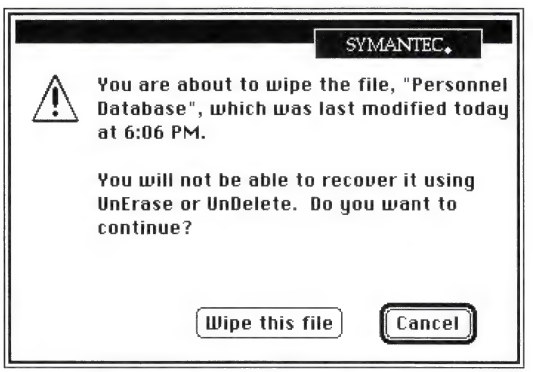


3 Select the name of the file you wish to delete from the scroll list.
The selected file's or folder's name with the Wipe Info icon appears on the right.

4 Click the Wipe File (or Wipe Folder) button.



A dialog box appears asking you to make certain that you want to delete the selected file permanently.


SYMANTEC.
You are about to wipe the file, "Personnel Database", which was last modified today at 6:06 PM.
You will not be able to recover it using UnErase or UnDelete. Do you want to continue?
Wipe this file
Cancel

5 Click Wipe this file to proceed.
Wipe Info erases the file permanently. Click Cancel before you start to terminate the erasure without affecting the file. When you click Wipe this file, the file disappears from the file selection dialog box list.

You can continue selecting and deleting files and folders as you wish.

6 Click Done to leave the file selection dialog box.
You return to the Wipe Info window.

7 To quit Wipe Info, click the close box or choose Quit from the File menu.
You can also choose another utility from the Utilities menu.

For more information about Wipe Info, see "Wipe Info" in Part II, *Reference*.

Erasing a Disk

› **To erase all data on a disk permanently:**

Wipe Info

1 Start Wipe Info by double-clicking its icon in the Finder.
The Wipe Info window appears.

Wipe Disk

2 In the Wipe Info window click the Wipe Disk button.
A dialog box appears where you can select the floppy or hard disk to be erased.

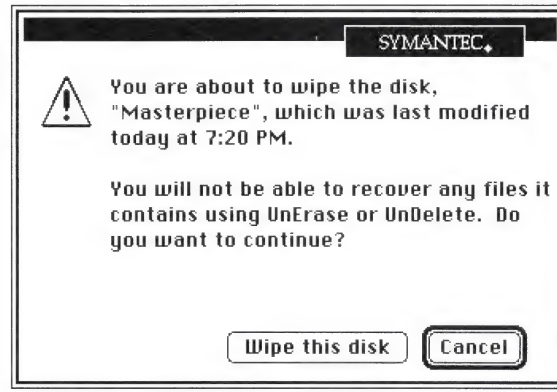
3 To select a different disk, click the Drive button.
The name of the drive you select appears in the center of the dialog box.

4 Click the Wipe Entire Disk button.

Wipe Entire Disk

A dialog box appears asking you to confirm that you really wish to wipe (erase) the selected disk.

5 Click Wipe this disk to proceed or Cancel to exit without affecting the disk.


SYMANTEC.
You are about to wipe the disk, "Masterpiece", which was last modified today at 7:20 PM.
You will not be able to recover any files it contains using UnErase or UnDelete. Do you want to continue?
Wipe this disk
Cancel

If you proceed, Wipe Info erases the disk completely. Wipe Info keeps you informed with a progress bar.

For information on wiping a drive to Department of Defense (DOD) specifications, see the Wipe Info Reference section of this manual.

Erasing a disk's free space

Once you wipe the free space on a disk, you cannot use UnErase to retrieve files you deleted *before* you wiped the disk

However, files that you delete *after* you wipe a disk's free space can be retrieved-until you wipe the free space again!

› **To erase a disk's free space:**

Wipe Info

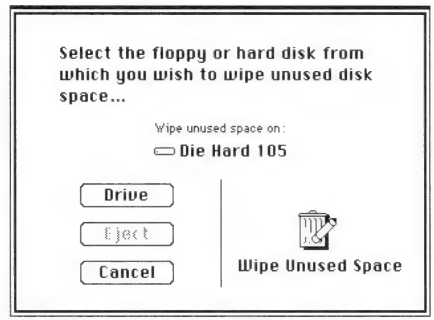
1 Start Wipe Info by clicking its icon in the Finder.
The Wipe Info window opens.

Wipe Unused Space

2 Click the Wipe Unused Space button.
The Wipe Free Space dialog box appears, where you specify the disk whose free space you want to wipe.

Figure 6-1

Wipe Free Space volume selection dialog box


Select the floppy or hard disk from which you wish to wipe unused disk space...
Wipe unused space on:
Die Hard 105
Drive
Eject
Cancel
Wipe Unused Space

3 Specify the disk drive. To select another drive, click Drive. To change a floppy disk, click Eject.

The name of the volume you select appears in the center of the dialog box.

4 With a drive selected, click the Wipe Unused Space button on the right side of the window.

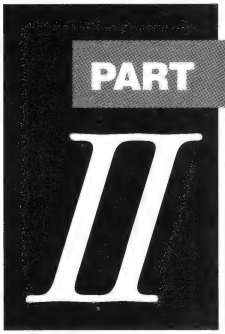
Wipe Unused Space

You'll be asked to confirm your choice. Click Cancel to terminate the procedure without wiping free space.

SYMANTEC.
You are about to wipe all the unused disk space from "Die Hard 105", which was last modified today at 10:27 AM.
You will not be able to recover any already deleted files using UnErase or UnDelete. Do you want to continue?
Wipe unused space
Cancel

Wipe Info proceeds to wipe all unused space. Any erased data will no longer be retrievable by any means.

For more details about Wipe Info, see "Wipe Info" in Part II, *Reference*.



Reference

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R-45 Floppier
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Directory Assistance II

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R-6 When to Use
R-7 How to Use
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R-13 Drive Menu
R-14 Tools Menu
R-16 View Menu
R-17 Workset Menu

Directory Assistance II

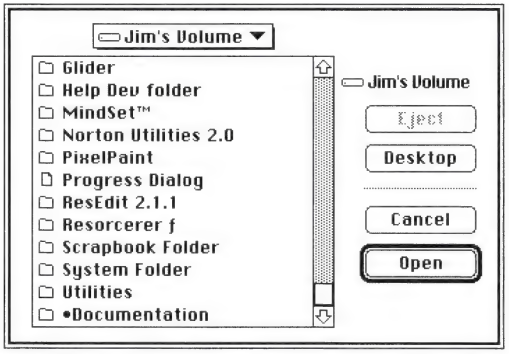
Directory Assistance II (DA II) is a startup document (a system extension in System 7) that allows you to add "Finder-like" power to the standard Macintosh Open, Save, and Save As dialog boxes.

About Open and Save As

When you choose the Open command from the File menu within any application, a dialog box similar to the one below appears. (The precise arrangement and number of elements in the dialog box may vary depending on the application you're using and other factors.)

Figure DA-1

The Open dialog box without Directory Assistance II



A directory of the current folder or disk appears in the scrolling list to the left, and the title and corresponding icon of the disk or folder appear above the list. To the right of the directory list are the name and icon of the current volume and the Open, Cancel, Eject, and Disk (System 7: Desktop) buttons.

Notice that the directory list is in alphabetical order and contains a mix of both folders and documents. The particular directory you see when you choose Open is for the last folder (or disk, at the highest level) from which you opened a document (if you haven't changed drives, that is—if you have changed drives, you start off at the highest level). Find the document you want to open from within the application you're using at the moment.

The Save As dialog box is virtually identical to the Open dialog box, with the exception of an additional text box where you type the name you want to give to the document you're saving. It may also include additional checkboxes or buttons used to specify, for example, the file format in which you want to save the document.

From time to time you may want to perform a Finder function, like creating a new folder for an application or deleting an unneeded file or folder to make room for a new one. In the past, you had to cancel the dialog box and possibly even exit the application to make the needed changes. You also want to be able to locate frequently used files and folders as quickly as possible, and those files and folders probably vary depending upon the application you're working in. You could scroll through the directory list, looking for the information you want, but that takes time. Directory Assistance II is designed to make these and other tasks quicker and easier.

When to Use

Directory Assistance II combines certain features of the Finder with the functionality of the Open or Save As dialog box. Use Directory Assistance II to speed up Open dialog box functions.

An exciting new feature of Directory Assistance II is the ability to create, use, and modify worksets. A workset is a group of favorite files and folders. You can associate a specific workset with each and every application. Thus, you can have a Microsoft Word© workset to use in Microsoft Word©, an Adobe PhotoShop© workset to use in PhotoShop©, and so on. You can have each workset contain the files and folders you want to use when working with its application. You can also switch worksets within an application.

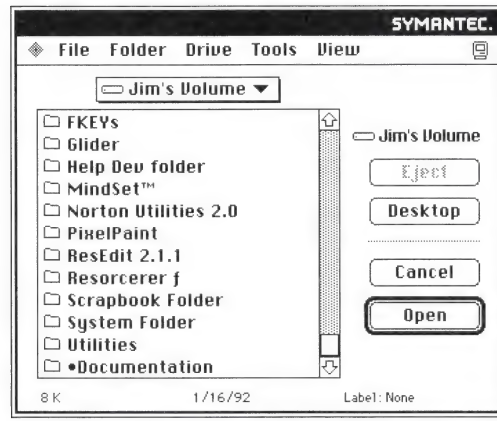
Once you've added files and folders to a workset, you can very quickly open them without having to navigate in the scrolling list; just choose the item you want from the appropriate DA II menu. What's more, you can even assign command-key shortcuts to specific files or folders. Thus, to open a file, no matter where it is on your system, you can choose Open within your application, press the file's command-key shortcut, and you're there. This can be very handy for documents you open all the time, such as fax cover sheets and invoices.

How to Use

Take a look at the Directory Assistance II dialog box:

Figure DA-2

Open dialog box with Directory Assistance II



You'll immediately notice the addition of a menu bar at the top of the dialog box. Use the DA II menu (indicated by a diamond icon) to configure Directory Assistance II. The File menu, the Folder menu, the Drive menu, and the Workset menu (indicated by a compact Macintosh icon) are used to access workset features explained later in this chapter. Pull down the Tools menu to access file- and folder-related commands. Use the View menu to change how files and folders are sorted in the dialog box's scrolling list.

As you're preparing to open a document, you may notice things in the Open dialog box that you'd like to change. Perhaps you'd like to get more information on an item before you open it (you might need to know when the item was created or last modified, for example). Or you realize that a document needs to be deleted. Or maybe you can't even find a particular folder or file. You can now perform all these powerful organizational tasks without leaving the Open or Save As dialog box.

You can also change the way in which you see the contents of a particular directory. You might want to view all the files first—arranged by size in bytes, let's say—then all the folders. Pull down the View menu to change the normal viewing method (which is alphabetical by name, with folders mixed with files).

As you work with Directory Assistance II, it also remembers where you were in the directory hierarchy. For example, when you change volumes, you won't have to start over from the highest (disk) level. It remembers which folder you were in for each drive. It will even remember how you like to view items in the scrolling directory list, whether by name, date or size, and with folders first or last. Note that this feature works only as long as you're within a dialog box supported by DA II; DA II doesn't remember where you are between sessions.

Directory Assistance II Menus

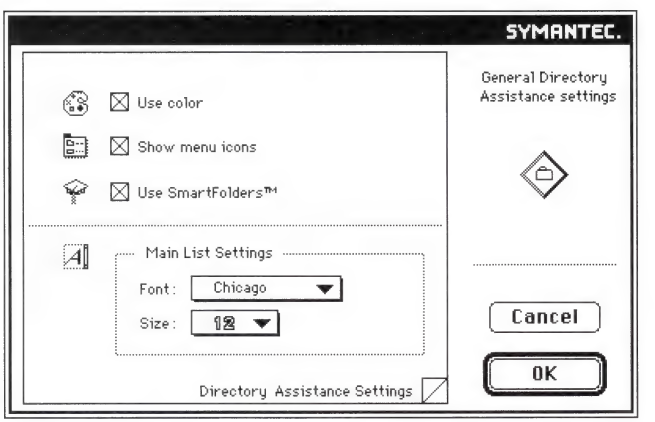
Directory Assistance II options and controls are contained in the following menus.

Directory Assistance II Menu

- **About Directory Assistance II**
  Gives copyright, version number and developer information for this startup document.
- **General Directory Assistance II Settings**
  Brings up the General Settings dialog box in which you can change the program settings applying to Directory Assistance II as a whole.

Figure DA-3

The General Settings dialog box



At the upper left of the dialog box are three checkbox options. You can choose whether to use color, to show menu icons (shows file, folder, and drive icons in the DA II menus), or to use SmartFolders.

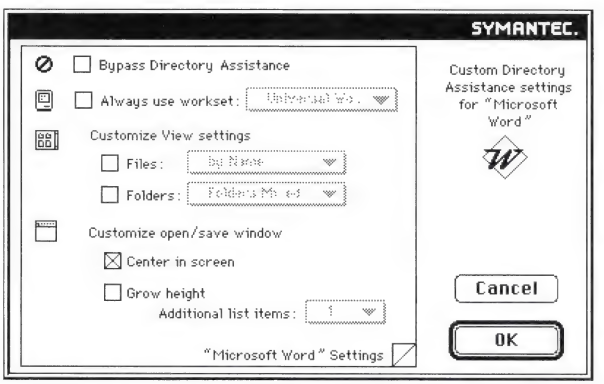
This last option makes DA II remember the last folder that was open when you switched drives; when you switch back, that folder will be open rather than the root directory of the drive. This saves you from hunting for the last folder you were in.

Below the three checkboxes are two pop-up menus that allow you to select the font and font size to use in the scrolling list. Click Cancel to discard changes and return to the original dialog box, or click OK to save changes. Click the dog ear at the lower-right to switch to the application program settings page. Here, you give specific settings for the application program you're currently using. When you click OK after making changes, Directory Assistance II will ask you to confirm that you want to save changes.

- **Application Settings**
  Brings up the Settings dialog box set to the application-specific page. You can change the way DA II works in the current application or desk accessory alone (that is, in the application whose Open dialog box you're in at present).

Figure DA-4

Application Settings dialog box

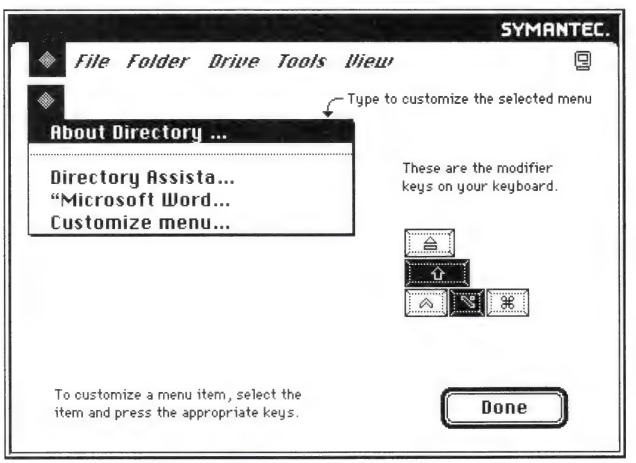


There are a number of checkbox options. You can choose to always bypass Directory Assistance II for a given application. You can specify which workset to open to in the application. You can customize view settings, choosing how to show files and folders in the dialog box scrolling list. Finally, you can customize the dialog box itself. You can have it center in the screen, and you can give it additional grow height. This last option lets you specify how many files/folders to show in the scrolling list of the dialog box. Click Cancel to discard changes; click OK to save them.

- **Customize Menus**
  Use this command to add command-key equivalents to the DA II menus. When you choose this command, a dialog box appears that represents the DA II menu bar.

Figure DA-5

The Customize dialog box


SYMANTEC.
File Folder Drive Tools View
Type to customize the selected menu
About Directory ...
Directory Assista...
"Microsoft Word...
Customize menu...
These are the modifier keys on your keyboard.
To customize a menu item, select the item and press the appropriate keys.
Done

To set a command-key equivalent for a menu item, choose the item from the appropriate menu in the Customize dialog box. Hold down at least one modifier key (these are Control, Command, Option, Shift and Caps Lock) and type a number or letter key to assign to the menu item.

Thus, to assign Command-Option-A to About Directory Assistance II in the DA II menu, choose that item in the Customize dialog box, hold down the Command and Option keys, and type the letyter "a". If you have an extended keyboard, you don't have to hold down a modifier key to assign a function key (F1 through F12) to an item.

File Menu

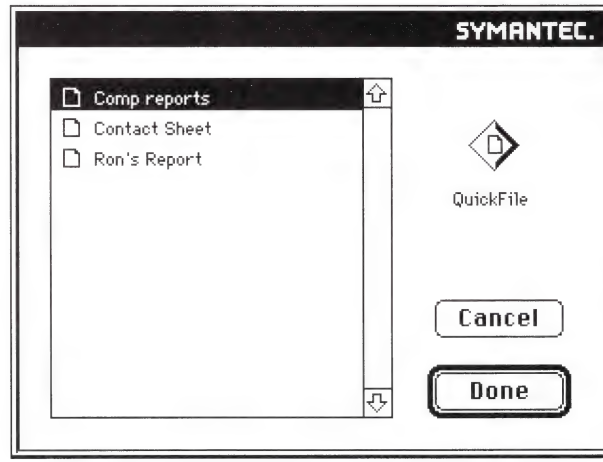
If you have selected any files to add to the current workset, or have chosen to track temporary items, these appear at the top of the menu above a dotted separator line. You can change the order in which these items are shown with the Configure command in this menu.

- **Add Selected File**
  If you have selected a file name in the dialog box scrolling list, you can add it to the File menu by choosing this command. The item appears in the QuickFile submenu. Note that this feature is workset-specific: the file appears in the File menu for the current workset only. You have to specifically add it to other worksets if you want to see it there.

- **QuickFile**
  Brings up a dialog box with a list of all added files. Select an item and click Done to open it. Why use this instead of the File menu? Because you can open a file without using the mouse, by choosing QuickFile and typing the first few characters of its name and pressing Return. Click Cancel to return to the DA II dialog box.

Figure DA-6

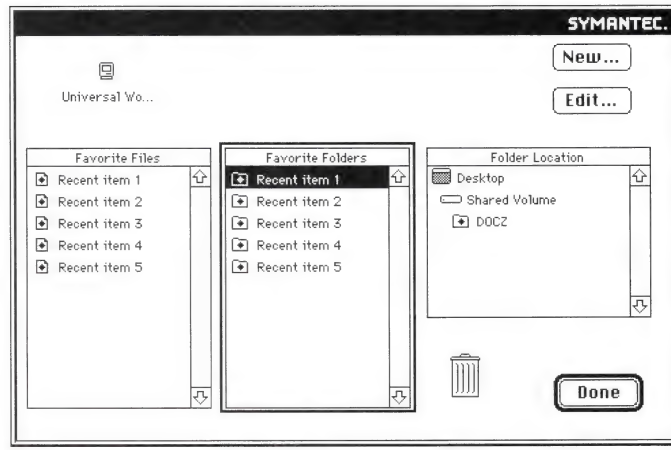
The QuickFile dialog box



- **Configure**
  Accesses the Workset Configuration dialog box, set for the current workset.

Figure DA-7

The Workset Configuration dialog box



To change the order of items in the File menu, drag them to the locations you desire. Drag an item to the Trash to delete it from the workset. Click Done to return to the main dialog box.

Folder Menu

If you have selected any folders to add to the current workset, or have chosen to track temporary items, these appear at the top of the menu above a dotted separator line. You can change the order in which these items are shown with the Configure command in this menu.

- **Add "Current Folder"**
  Adds the selected folder to the folder hotpad and the Folder menu. (If no folder has been selected, the current folder is added.) Note that this feature is workset-specific: the folder appears in the Folder menu for the current workset only. You have to specifically add it to other worksets if you want to see it there.

- **QuickFolder**
  Brings up a dialog box with a list of all added folders. Type in the first few characters of an item's name and press Return or double-click the item to open it. Click Cancel to return to the DA II dialog box: (See Figure DA-6.)

- **Configure**
  Accesses the Workset Configuration dialog box, set for the current workset. (See Figure DA-7.)

To change the order of items in the Folder menu, drag them to the locations you desire. Drag an item to the Trash to delete it from the workset. Click Done to return to the main dialog box.

Drive Menu

All your currently mounted disk drives appear above the dotted separator line. Aliases to other drives (if any) appear below the line.

- **Add Selected Drive Alias**
  (System 7 only) Adds the selected drive alias to the drive hotpad and the Drive menu. Note that this feature is not workset-specific: the drive alias always appears in the Drive menu. Use this to quickly mount an unmounted drive (such as a file server volume) for which you've created an alias.

- **QuickDrive**
  Brings up a dialog box with a list of all available and added drives and their aliases. Type the first few characters of drive's name and press Return or double click on the icon or name to open it. Click Cancel to return to the DA II dialog box.

Tools Menu

- **New Folder**
  Choose this command to create a new folder at the same level of the directory you're viewing in the scrolling list of items. It does not matter whether an item in the list is selected. The new folder created will be at the same level as the items in the directory list and will be selected automatically.

  Type the name of the new folder in the text box that appears and click the Create button or press Return to complete the creation of a new folder. Click the Cancel button to return to the main dialog box.

  In the Save As dialog box, the New Folder command is quite useful when you want to place the document you're saving into a new folder without having to exit the application to create a new folder with the Finder.

- **Get Info**
  Choosing this command has the same effect as choosing Get Info within Fast Find. There are three types of Get Info settings:

  General: Lists the icon and name of the selected item, its kind (document, application, and so on), its size in bytes, its location (which volume), its creation and modification dates, and its version number (for applications). The lower-left checkbox indicates whether a document or application (but not a folder) is locked (cannot be changed or thrown away). Use this last item to lock files and prevent them from being overwritten or to unlock an item in order to save changes to it. At the upper-right is a list of other settings you can change.

Settings: Shows the name, type, and creator of the selected item, along with attribute data. System 6 attributes are "Can't be Renamed in Finder," "is Invisible," and "is on Desktop." System 7 attributes that you can change are "is Alias," "is Invisible," "Can't be Renamed in Finder," "is Stationery," and "has Custom Icon."

Icon: In System 7, you can edit the item's icon. (System 6 doesn't support custom icons, so you can't edit an item's icon.) Consult the *Reference* chapter on Fast Find for information on using the icon editing tools.

Click Cancel to discard settings changes or Update to record them.

Duplicate: This command creates a copy of the selected item with the same name as the original preceded by the words *Copy of.* (In System 7, the word "copy" is appended to the item name.) It is useful in creating quick backup copies of items. These duplicates can be renamed later with the Finder if necessary. You can duplicate folders and their contents, including folders within folders.

Find: Choosing this command brings up a text box where you type the name or part of the name of a file you wish to *quickly* locate. The command scans all mounted drives, starting with those local to your computer.

Find Again: Choose Find Again to search for another occurrence in a file or folder of the last text entered in the Find dialog box.

Delete: This command does exactly what its name implies. To delete an item, select it in the list and choose the Delete command. You are asked to confirm your choice with an alert box whose default is Cancel.

In the Open dialog box, you're only shown documents that may be opened by the application you're working with. Should you attempt to delete a folder that is apparently empty, you'll be shown the number of documents and applications that are actually in the folder.

View Menu

- **by Name**
  This command allows you to view items in the directory list alphabetically by name, which is the normal order in which directory dialog boxes display items in the list. Note that uppercase and lowercase versions of the same letter are treated as equivalent. Items with punctuation marks at the beginning of their names appear first; that is, a file named */resume* will appear before *resume*.

- **by Date**
  This command lists items chronologically by date. The date associated with a *document or application* represents the last time it was changed or modified in any way, whereas the date associated with a *folder* represents the last time an item was added to or deleted from it. Notice that items modified most recently appear first. The modification date for the item selected is displayed at the bottom of the scrolling list. Your most recently used (modified) files will be listed first, making it convenient to open them quickly.

- **by Size**
  Choose "by Size" to display items in the directory list by size with the smallest item first. A folder's size is based on the number of items it contains; for documents and applications, size is determined by file size.

- **by Color**
  Choose "by Color" to view all items in order by their icon color. (System 7: This item is called "by Label.")

- **Folders Mixed**
  This is the preset option, with files and folders alphabetized together, and the folders mixed among the files.

- **Folders First**
  This command places folders first in the directory list, whether the items are organized by name, date, or size.

- **Folders Last**
  This command places folders last in the directory list, whether the items are organized by name, by date, or by size.

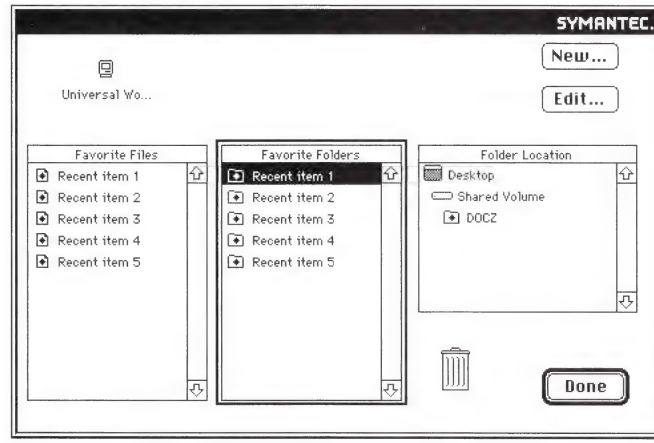
Workset Menu

All the worksets you have defined are shown at the top of this menu. To change worksets, choose the one you want. The icon designating the Workset menu will change to the icon for the new workset, presuming the icon is different from the current one.

- **Configure**
  Brings up the Workset Configuration dialog box, similar to selecting Configure in the File and Folder menus of DA II. You can edit existing worksets and create new ones.

Figure DA-8

The Workset Configuration dialog box



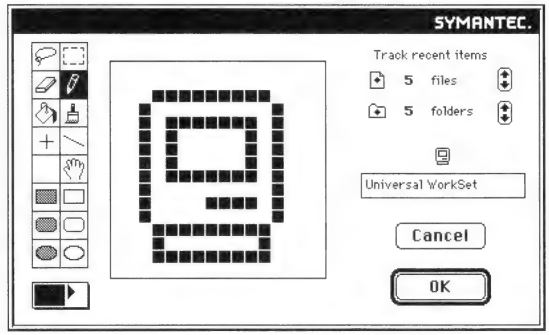
At the top of the dialog box is a selection bar showing all your defined worksets. A rectangle appears around the current workset. Click a workset icon to select it for editing.

You can drag the items in either favorite files or favorite folders to change the order they appear in. To delete items, drag them to the Trash at the bottom-right of the dialog box. Click Done to save changes. You can also create new worksets (with New) or change existing ones (with Edit).

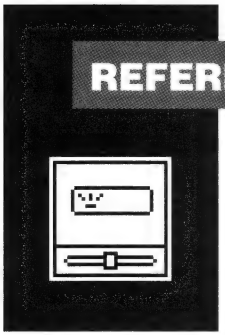
- **New**
  Brings up the New Workset dialog box. You can use the editing tools to change the workset's icon from the default. (See the Reference chapter on Fast Find for information on using the icon editing tools.) Use the arrow controls at the bottom of the dialog box to specify how many temporary files and folders to track in the File and Folder menus. Type a name for the workset into the text box at the bottom. Click Cancel to discard changes; click OK to save them.

Figure DA-9

The New Workset dialog box



- **Edit**
  Brings up the Edit Workset dialog box. You can use the editing tools to change the workset's icon from the previous design. (See the *Reference* chapter on Fast Find for information on using the icon editing tools.) You can specify how many temporary files and folders to track in the File and Folder menus using the two pop-up menus at the bottom of the dialog box. Type a new name (if desired) for the workset into the text box. Click Cancel to discard changes or OK to save them. (See Figure DA-9.)



DiskLight

Contents

R-21 DiskLight
R-21 When to Use
R-21 How to Use

DiskLight

DiskLight is a startup document/control panel device that keeps you informed of activity on both your hard and floppy disk drives.

When to Use

More than anything else, disk activity is a good indication of the current "health" of your system. If your disk seems to be taking a long time to accomplish a task, it's usually a good sign if there is a lot of disk activity and that the activity is not patterned or rhythmic. On the other hand, it is quite strange for there to be disk activity when you haven't done any tasks for a while. DiskLight keeps you informed of such activity by displaying a small disk icon in a specified corner of the menu bar. There are distinct icons for hard disks and floppy disks.

Although most hard drives have a disk drive light that shows activity, and it's easy to tell by the sound when a floppy drive is active, it's not always possible to tell when a drive is being read from or when it's being written to. In addition, you may have your Macintosh on the floor or under your desk to save space; in that case, you can't see the disk drive light from your chair.

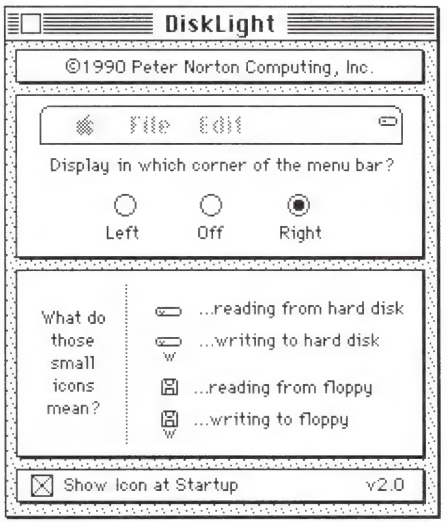
How to Use

You must copy the DiskLight document to your System Folder and restart your Macintosh before DiskLight will work. You should do this at the same time you install FileSaver and Directory Assistance II.

DiskLight is configured through the Control Panel, which you access through the Apple menu.

Figure DL-1

The DiskLight Control Panel



You may configure the disk light to appear in either the left or right corner of the menu bar. Click the appropriate option button to do so, or click the end of the menu bar. If your Macintosh is on a network, you should put the DiskLight icon to the right; your network activity icon appears in the left corner and could obliterate the DiskLight icon if it's also on the left.

To prevent DiskLight from becoming active, hold down the Option key as you start your Macintosh. Unless you've unchecked the "Show Icon at Startup" option, you'll see the DiskLight icon with an "X" through it as your Macintosh starts. This indicates that you've disabled DiskLight.

Fast Find

Contents

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R-25 When to Use
R-25 How to Use
R-26 Searching with Fast Find
R-27 How to Check Search Progress
R-27 Working with a Selected File or Folder
R-28 Fast Find Menu

Fast Find

Fast Find is a desk accessory that allows you to find files and folders quickly, move them to the desktop and open them, and view and copy data from text files instantly without opening the applications that created them.

When to Use

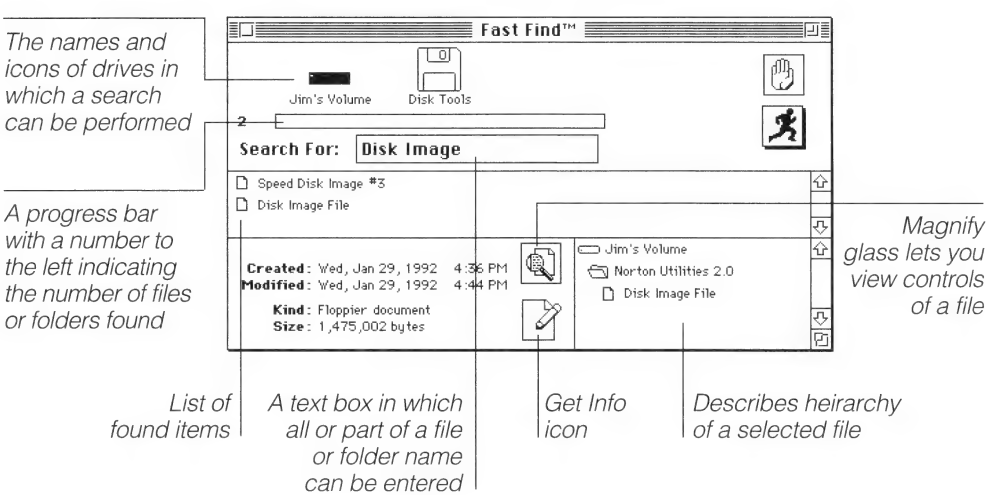
You can search one or more volumes at a time, whether local (your internal hard disk, for instance) or remote (a file server, for example). There's also the option of limiting a search to a certain folder. You may rename files and change their Finder attributes as well. Fast Find will work either in the foreground or in the background, allowing you to locate documents and applications while you continue to work in another application.

How to Use

To start Fast Find, choose Fast Find from the Apple menu. The Fast Find window appears.

Figure FF-1

The Fast Find main window


The names and icons of drives in which a search can be performed
A progress bar with a number to the left indicating the number of files or folders found
Fast Find™
Jim's Volume
Disk Tools
2
Search For:
Disk Image
Speed Disk Image #3
Disk Image File
Created: Wed, Jan 29, 1992 4:36 PM
Modified: Wed, Jan 29, 1992 4:44 PM
Kind: Floppier document
Size: 1,475,002 bytes
Jim's Volume
Norton Utilities 2.0
Disk Image File
Magnify glass lets you view controls of a file
List of found items
A text box in which all or part of a file or folder name can be entered
Get Info icon
Describes heirarchy of a selected file

The "stop hand" and "running man" icons to the right are used to stop or to initiate a search. The running man is animated when a search is in progress. (Hold down the Option key when clicking the running man button if you wish to disable animation; Fast Find will work slightly faster with animation disabled.)

The middle part is a scrolling list of items found that match the search criteria.

The bottom area is divided into left and right boxes that give further information about a file and a full path description showing you exactly where a file resides on a particular volume. Notice that the shadowed magnifying glass button located in this area of the Fast Find window is used to view a file selected in the scrolling list of items found.

The path box at the bottom-right indicates when files are on the desktop. A desktop icon appears next to the name of the disk volume on which the file is stored. A trash icon appears next to items that are in the Trash folder.

The window can be resized if necessary to accommodate a long list of matching items.

Searching with Fast Find

Choose *where* to search by clicking a volume icon at the top of the Fast Find window. Fast Find displays only three volume icons at a time. If you have more than three volumes, click the appropriate shadowed arrow button with the mouse or use the Tab key to see other volumes (arrows only appear when you have more than three volumes mounted). Note that several or all volumes may be selected for your search. Shift-clicking adds volumes when one has already been selected. You can search through all volumes by choosing the Select All Drives command in the Fast Find menu. Double-clicking a volume icon or issuing the Search Folder command from the Fast Find menu allows you to specify a particular folder to which the search is limited. If you insert a disk while you are running Fast Find, its icon will automatically appear in the list of available volumes.

Next, choose *what* to look for. Type text representing all or part of a file or folder name into the text box in the upper section of the Fast Find window.

Searches are not case-sensitive. Fast Find will search for both the lowercase and uppercase version of each letter you type. Fast Find also looks for "international" versions of each letter (that is, those with diacritical marks or accents, such as *â*). For example, entering *res* is sufficient to find files named both *Client's résumé* and *Resume*.

To initiate a search after you choose where and what to search, click the running man button or press Return.

How to Check Search Progress

Fast Find begins searching the volume represented by the selected icon at the far left. If other volumes are selected, they will be searched after that volume. In addition to the progress bar, which fills from left to right as a volume is scanned, there are certain other visual and auditory cues used to inform you about the progress of a search.

Once a search is initiated, a volume icon remains highlighted only when it is in the process of being examined for files and folders that match the search data entered in the text box. The numeral that appears to the left of the progress bar indicates the current number of matching files or folders for the search currently in progress. The scrolling file list fills up as matching files and folders are found. The running man "runs" until the search is completed or interrupted. (You can disable animation while a search is in progress by holding down the Space bar; this will increase search speed slightly.) Note that you can view files and perform operations on them even while a search is in progress, and you can interrupt a search at any time by clicking the stop hand button or by pressing Escape.

Fast Find notifies you with a chime when a search has been completed.

Working with a Selected File or Folder

Once you select a file or folder from the scrolling list of found items, you can immediately see when it was created and other useful information in the area below the scrolling list. On the right side of this lower area you also see where a selected file or folder is located in a volume.

You can move files *and* folders selected in this list of found items to the desktop for quick manipulation. You may rename a file, and even change its Finder attributes (see more on attributes in the Norton Disk Editor Reference section). You can also view individual files and open them without having to quit Fast Find. See the descriptions of the Move to DeskTop, Get Info, View File, and Open File commands below for more information.

Fast Find Menu

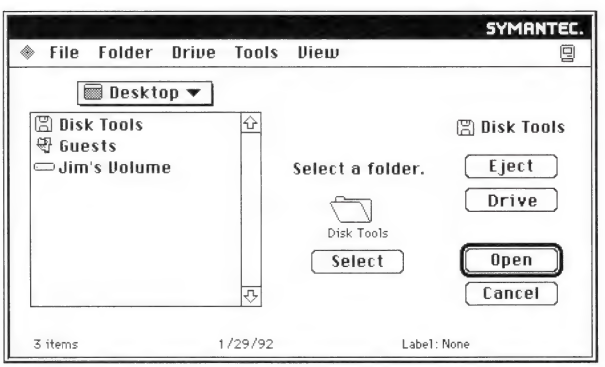
The Fast Find features are accessed with the following menus commands.

- **About Fast Find**
  This command gives copyright, version number and developer information for this desk accessory.

- **Search Folder**
  This command allows you to limit your search to one folder inside a particular volume. After you choose Search Folder, a dialog box appears that resembles the typical directory dialog box you encounter when you choose Open or Save As in other Macintosh applications.

Figure FF-2

The Search Folder dialog box



On the left of the Search Folder dialog box is a scrolling list of folders (but not files) contained in the currently selected volume. In the center is an icon representing the currently selected folder in the list, with the Select

button below it. On the right side of the dialog box is the currently selected volume icon and name, with the Eject, Disk, Open, and Cancel buttons below it.

You can limit the Fast Find search to a certain folder using the Select button. Select one of the folders shown in the scrolling list, then press the Select button. The icon of the folder you've chosen for the search replaces the volume icon in the list at the top of the Fast Find main window. Fast Find will search that folder and all folders within it.

If the Eject button is active (not dimmed), it will eject the currently selected volume. The Disk button allows you to change the currently selected drive. Click it to change the search from a disk to a hard drive, for example. Choose Open if you want to see other folders inside the currently selected folder in the scrolling list. The Cancel button returns you to the Fast Find main window with no change in the target of the search.

- **Search Drives**
  You'll notice that the Search Folders command in the Fast Find menu changes to Search Drives if you've already selected a specific folder to search. Choosing Search Drives, then, replaces a folder icon with volume icons in the list at the top of the Fast Find window. The volume containing the folder previously chosen for a search is automatically selected.

- **Move to Desktop**
  Choosing this command moves the file or folder selected in the scrolling list to the desktop, no matter where that file or folder may be located. This command is particularly useful in disk housekeeping—throwing files into the Trash, changing their placement in the overall disk organization, and so on. You can use the Put Away command in the File menu of the Finder to put items back where they were once you've finished manipulating them on the desktop.

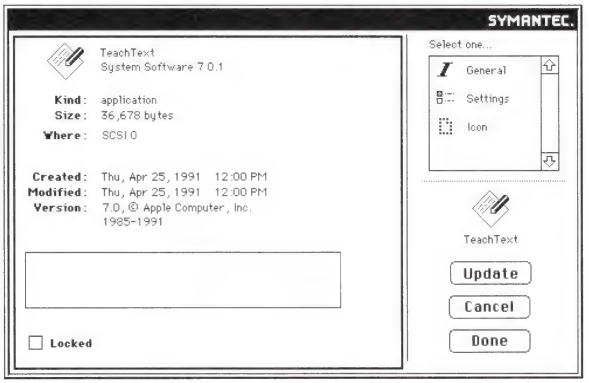
- **Select All Drives**
  This command is a handy alternative to selecting all the volume icons in the list at the top of the Fast Find window. Choose it when you want to search through every available volume for a file or folder.

- **Get Info**
  This command brings up a dialog box showing information about the currently selected file. You may view general information such as that shown by the Finder Get Info command. You may also view more esoteric information such as the file's type and creator codes, and its Finder attributes. You can even edit the file's Finder icon.

  General: When you first choose Get Info, a dialog box appears showing general information about the selected file.

Figure FF-3

The Get Info General dialog box



The area at the left of the dialog box shows the file's name and icon, what kind of file it is and its size, and where it was created. The date and time of the file's creation are shown, as are any Finder comments. A checkbox at the bottom of this area shows whether the file is locked.

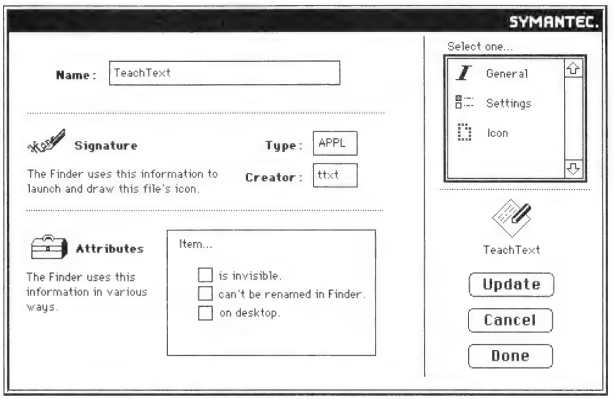
If the file is not locked, you can change its Finder comments. Type new comments into the text box at the bottom-left of the Get Info dialog box.

At the upper right of the dialog box is a list of other information that you can view. Click Settings to see the file's Finder attributes; click Icon to view or edit its Finder icon. When you click any of these choices, the Get Info dialog box changes to show the information you requested.

Settings: When you select Settings, the Get Info dialog box shows the file's name, its type and creator codes, and its Finder attributes. You can rename the file or change its creator and type codes by typing new values into the appropriate boxes.

Figure FF-4

The Get Info settings dialog box



To get directly to the Settings page of the Get Info dialog box, double-click the text showing the file's creation date at the bottom left of the Fast Find main window.

Changing a file's creator or type codes can prevent its application from being able to open it. In the case of an application, it can render the application (temporarily) un-launchable. Don't change these codes unless you know what you're doing.

To change Finder attributes, click the appropriate checkboxes.

For more information on Finder attributes, refer to the chart in the "Norton Disk Editor" reference section. The attributes you can edit are: is invisible, can't be renamed in Finder and on desktop (in System 6), and: is an alias, is invisible, can't be renamed in Finder, is a stationary pad, and has a custom icon (in System 7).

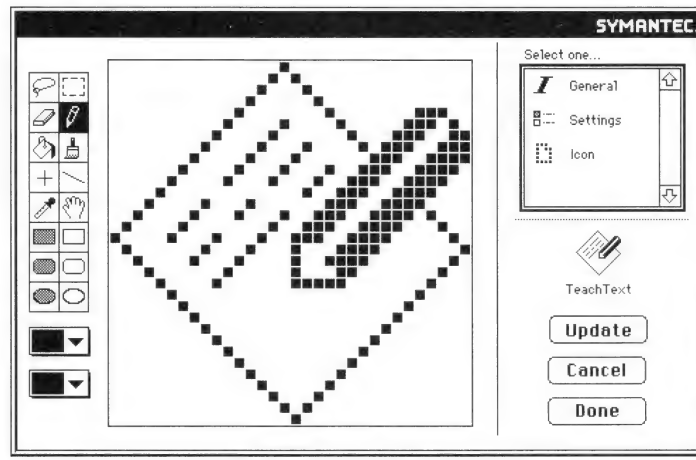
To save changes to the file's attribute information, click the Update button at the bottom right of the dialog box. To discard changes, click Cancel.

Icon: The following feature is available in System 7 only. When you select Icon at the upper-right of the Get Info dialog box, the dialog box changes into an icon-editing tool.

To get directly to the icon editing page of the Get Info dialog box, double-click the file's icon on the bottom left of the Fast Find main window.

Figure FF-5

The Get Info icon editing dialog box



An enlarged representation of the file's icon appears in the center of the dialog box. Use the drawing tools from the palette on the left side of the dialog box to edit this icon representation.

Click the Update button at the bottom-right of the Get Info dialog box to save changes to a file's icon. Click Cancel to discard changes and dismiss the dialog box. Generally, you must restart your Macintosh before you'll see changes to a file's icon in the

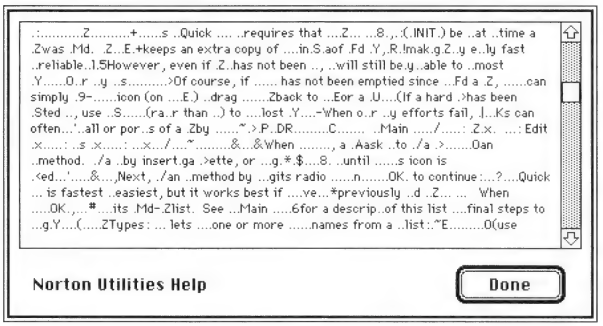
Finder or elsewhere. If the file's icon hasn't been displayed since you last started (for instance, if the file is in a folder you haven't opened) then changes to the icon will appear immediately.

- **View Document**
  Choose this command to view the contents of the file currently selected in the scrolling list of items found. You don't need to worry about the application that created the file you wish to view since that application is not opened or started with this command. In fact, Fast Find allows you to look at files whose creation applications are "missing or busy." Of course, viewing files with Fast Find won't be exactly like viewing them in their native applications (and you'll only see the first 32K of the file), but it's definitely a quick way of making sure you've got the right file before you open it with its parent application.

  To view a file, select its name in the scrolling list of items found and choose View Document, or click the magnifying glass button at the bottom of the Fast Find main window. Doing so will cause a window to appear. This scrolling window displays the contents of the file you've selected and the filename at the bottom.

Figure FF-6

Viewing a document in Fast Find



You can copy information from the file to the clipboard. In this way, you can retrieve data from a file without going to the trouble of opening it. Select the desired data in the usual way and press Command-C to copy it to the clipboard.

Click the Done button in the lower-right corner to escape the view window and return to the Fast Find main window.

- **Open Document**
  The Open Document command will open a selected file directly from Fast Find if it is able. Select a file from the scrolling list of items found, then choose Open Document or simply double-click the filename. If Fast Find recognizes what kind of application created it and is able to locate that application, it will open the file. If not, the standard directory dialog box will appear, prompting you to locate the necessary application with which to open the selected file. If Fast Find "beeps" at you and doesn't open the document or application selected, you may not have enough memory to do so.

- **Quit**
  Choose Quit to exit Fast Find and return to the Finder or to the application that was active before you opened Fast Find.

FileSaver

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R-38 Easy Level FileSaver
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FileSaver

FileSaver is a combination system extension/Control Panel that is a vital part of the Norton Utilities for Macintosh. Once installed and activated, FileSaver creates special files on your disk in which it keeps records of all your documents, applications, and folders. When you throw a file into the Trash, FileSaver makes a note of it. When you eject a disk or shut down your computer, FileSaver updates the status of your disk. (You may also update this information at will using the FileSaver hot-key option.)

When to Use

Once you install FileSaver, it operates automatically, maintaining information about your disks. UnErase and Volume Recover use FileSaver's information to restore accidentally erased files and recover damaged disks. Volume Recover and the Quick UnErase feature of UnErase work much better when FileSaver is activated.

How to Use

If you didn't include FileSaver in the initial installation procedure, you must first copy the FileSaver document to your System folder (this folder always has a small Macintosh icon on it). You must then restart your computer to activate FileSaver. Finally, you must enable FileSaver by clicking its icon in the Control Panel list and by making the desired selections (including the number of files to protect).

The FileSaver control panel must be dragged to the Control Panels folder inside your System folder. The Norton Installer does this for you. If your System folder is closed, FileSaver will be put into the Control Panels folder when you drag it to the System folder. To access FileSaver, double-click its icon.

The FileSaver icon appears at the bottom of your screen during startup.

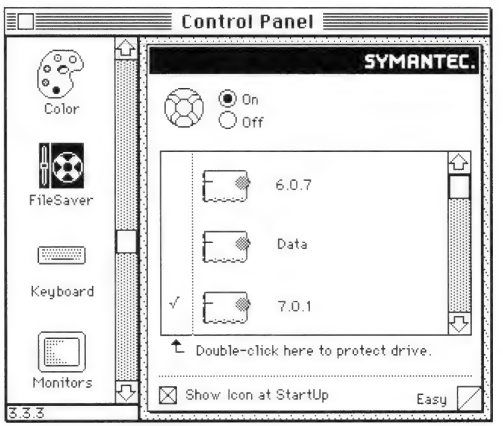
Configure FileSaver through the Control Panel, which is accessed through the Apple menu. FileSaver has two levels: Easy and Expert. Move between these two levels by clicking the dog ear at the bottom-right of the FileSaver control panel.

Easy Level FileSaver

In Easy level, the FileSaver control panel looks like this:

Figure FS-1

Easy Level FileSaver



The two option buttons at the top of the panel turn FileSaver on or off. Below the option buttons is a scrolling list showing all currently available disk volumes. Double-click in the column to the left of a volume's name to activate FileSaver protection for that volume.

A checkbox at the bottom of the screen lets you disable the FileSaver icon, which is normally shown at the bottom of your screen as your computer starts. The dog ear at the bottom right switches you to Expert level when you click it.

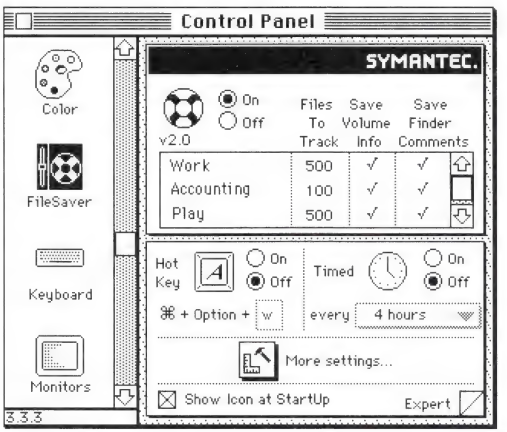
Clicking the Off button disables FileSaver protection for all your disks. Clicking the On button turns FileSaver back on for checked drives only.

Expert Level FileSaver

FileSaver's Expert level gives you additional options and flexibility.

Figure FS-2

Expert Level FileSaver



At the top of the FileSaver Expert control panel is a list of available volumes. Above this are option buttons that turn FileSaver on and off, just as in the Easy level. Unlike Easy level, you can select how many files FileSaver should keep track of. The more files you choose to remember, the more disk space FileSaver will need. Realistically, about 200 to 500 files will be recoverable at any given moment because erased files will eventually begin to be overwritten by other files.

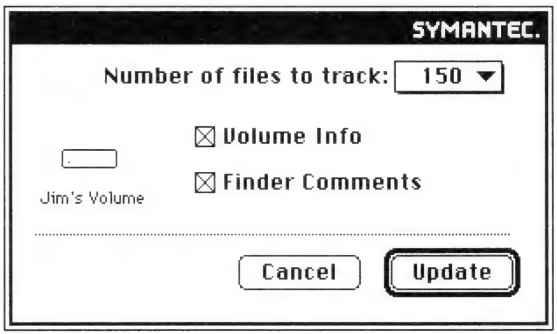
You can also choose whether to save your volume information (which is highly recommended) and Finder comments (also recommended). To change any of the options for a particular drive, double-click in one of these three columns opposite the drive's name. A dialog box appears.

As a shortcut, hold down the Option key and click in any of the columns to set a particular option. In the case of number of files protected, hold down the Option key and the mouse button to see a pop-up menu. Select the number of files to protect from this menu.

The FileSaver settings dialog box lets you customize the FileSaver settings for the drive you selected. A pop-up menu lets you select the number of files to track. Checkboxes allow you to select whether to save volume information and Finder comments. Click Update to save changes or Cancel to discard changes.

Figure FS-3

The Expert Level FileSaver Settings dialog box

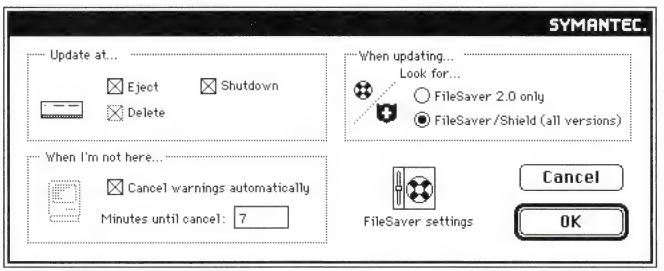


The bottom area of the FileSaver control panel allows you to specify additional ways of updating the FileSaver information files. Normally, these files are updated when you empty the Trash, when you eject a disk, and when you restart or shut down your computer. You can tell FileSaver to update its information whenever you press a specified key combination. The area at the bottom-left of the panel allows you do to so. Click the option button to turn the feature on. You must enter a key to press in combination with the Command and Option keys.

You can also instruct FileSaver to update its information automatically after a certain amount of time has passed. The area at the bottom-right of the FileSaver panel controls this feature. Click the option button to turn the feature on. The pop-up menu lets you select how often FileSaver should update its information. FileSaver won't interrupt you when it's time to update; it waits until your Macintosh is relatively idle.

The More settings dialog box

The More settings dialog box allows you to customize even further.



- **Update at...**
  These checkboxes allow you to choose when to update. (For Apple PowerBooks™, there is a fourth checkbox, for "sleep".)

- **When updating...**
  When you select FileSaver 2.0 only, FileSaver will no longer look to see if older Shield or FS files are resident on inserted disks, and you will have a performance improvement.

- **When I'm not here...**
  Use this setting when you've set FileSaver to check for FileSaver/Shield and warn when it is trying to update existing "out of date" files. You can set the warnings to stop after the number of minutes you choose.

Click OK to confirm changes and go back to the control panel.

As in the Easy level, you can disable display of the FileSaver icon at startup time; click the checkbox at the very bottom left to do so. Click the dog-ear to return to the Easy level.

Options Menu

You can also make changes to FileSaver information from the Norton Utilities Main Menu. The Options menu lets you make quick changes to FileSaver options without having to open the FileSaver control panel.

- **Install FileSaver Protection**
  Opens the FileSaver control panel to let you add or change FileSaver Protection for selected volumes. This is also useful for adding FileSaver to volumes that weren't mounted at startup. For example, you can add FileSaver Protection to your floppy disks.

- **Update FileSaver Files**
  Finds FileSaver files for all mounted volumes and updates the information for each volume. FileSaver does this automatically each time you shutdown your Macintosh, but you may want to update this information manually if you are making many changes to a volume. UnErase and Volume Recover use these files to restore damaged volumes.

- **Restore Finder Comments**
  Uses FileSaver information to recreate Finder Comments. These comments are deleted whenever you rebuild your desktop, so you may want to recover the comments afterwards.

- **Create VIF file**
  Creates a Volume Information File for a selected volume. The VIF is used by Volume Recover uses the VIF to recover files from a severely damaged volume.

Floppier

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R-49 Floppier Format Menus
R-49 File Menu
R-50 Edit Menu
R-50 Floppier Menu
R-50 Utilities Menu

Floppier

Floppier gives you a great deal more power and flexibility than the Finder when it comes to copying and formatting floppy disks. You can copy or format multiple disks with a single command. You can also store all the information from a floppy disk in a single file, called a *disk image*. You can store disk images on your hard disk—or even on other floppy disks—and use them to create multiple copies of the original disk.

When to Use

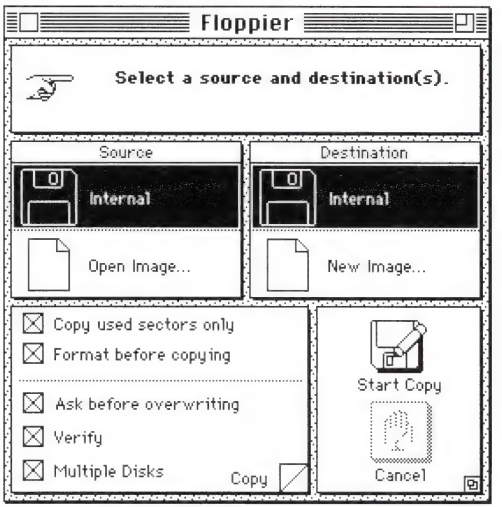
Floppier has several special features. For one thing, it copies around bad sectors on floppy disks. Thus, you can copy useful information from a bad floppy disk that you can't otherwise use. Also, Floppier is designed to make best use of your system configuration to avoid disk swapping on one-drive systems. If you have enough hard disk space available, Floppier uses it to good advantage when making copies. It also takes advantage of MultiFinder memory, so you can copy in the background while working on other tasks.

How to Use

When you start Floppier, the main window appears. This window is preset to the Copy layer. You can switch over to the Format layer by clicking the dog-ear at the bottom right of the window.

Figure FL-1

The Floppier main window



7 Drag either a floppy disk icon or a disk image file directly to the Floppier icon. This starts Floppier, and sets it to copy the disk or file that you dragged to it.

Copying with Floppier

At the top of the Floppier window is a message area. Below this are panels: use these to control the source and destination of copy operations. You can copy from a disk image file (more on this later) or from a floppy drive. You can copy to either a file or a floppy drive as well. If you have more than one drive available, these are indicated by their position: internal and external, top and bottom (twin drive Macintosh SE), or left and right (twin drive Macintosh II series).

Below the source and destination panels are a number of checkbox options. You can choose to copy used sectors only on the source floppy disk. This means that blank areas of the source disk aren't duplicated. This can make the target copy come out smaller, saving space. You can choose to always format a disk before copying; this lets you use disks right out of the box. You can have Floppier verify before it destroys data on

a target disk. You can ask it to verify that the information it writes is correct as well. Finally, you can ask it to make multiple copies of the same source disk. This is useful when you're making a whole batch of disks to distribute.

The two buttons at the bottom right control copying. Click Start Copy to begin copying; click Cancel to interrupt a copy operation already in progress.

About Disk Image Files

A disk image file is a complete representation of a floppy disk. You can store these files on a hard disk and make unlimited copies from them. It is quite common to see disk images on network hard disks. The Apple system software is sometimes stored that way. Note that the name of the disk image file, and the name of the floppy disk stored within it, do not have to be the same. Thus, a floppy disk created from a disk image file may have a different name than the original file. It will have the same name as the floppy disk used to create the image in the first place.

Floppier Copy Menus

Floppier copy functions are accessed through the following menus.

File Menu

- **New Image File**
  Creates an image file from a floppy disk.
- **Open Image File**
  Opens an image file and makes it the source file, ready to copy.
- **Quit**
  Exits Floppier.

Edit Menu

The Edit menu is provided for the use of any desk accessories you may want to run while you're in Floppier. (No Edit menu commands are active while you're using Floppier itself.)

Floppier Menu

- **Go to Format**
  Same as clicking the dog-ear. Takes you to the Format layer, which allows you to format disks.
- **Start Copy**
  Same as clicking the Start Copy button at the bottom of the Floppier window.
- **Eject All Disks**
  Ejects disks from any connected floppy drives.
- **Get Source Info**
  Brings up a dialog box that shows you a "map" of the source disk. Even MFS (older 400K disks) can be shown.

Utilities Menu

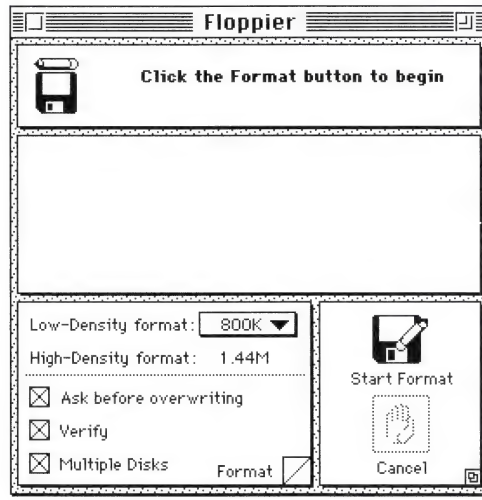
Use the commands in this menu to transfer to the other Norton Utilities for Macintosh.

Formatting with Floppier

When you click the dog ear with Floppier in its Copy layer, or you choose the Go to Format command from the Floppier menu, you're taken to the Floppier Format layer. The Floppier window changes accordingly.

Figure FL-2

The Floppier Format layer window



All controls are at the bottom of the window. You can set the default size for low-density disks: 400K or 800K. The size for high density (HD) disks is always 1.44MB. Through checkbox options, you can have Floppier confirm before it destroys old data, you can tell it to verify that a disk is good after it formats the disk, and you can specify that you want to format more than one floppy disk in this session. Click the Start Format button to begin formatting, and click Cancel to stop a format operation already in progress.

Floppier Format Menus

The Floppier formatting functions are accessed through the following menus.

File Menu

- **Quit**
  Exits Floppier.
- **New Image File**
  Allows you to give a name and folder location for a destination image file.

- **Open Image File**
  Lets you open a disk image file to use as a source.

Edit Menu

The Edit menu is provided for the use of desk accessories you may want to run while you're in Floppier. In addition, you can use cut, copy and paste features while editing disk and image file names.

Floppier Menu

- **Go to Copy**
  Same as clicking the dog-ear. Takes you to the Copy layer.
- **Start Format**
  Same as clicking the Start Format button at the bottom of the Floppier window.
- **Change Default Name**
  Brings up a dialog box that lets you change the name given to all newly formatted disks.

Utilities Menu

Use the commands in this menu to transfer to other Norton Utilities for Macintosh.

On-line Help

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R-53 When to Use
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R-55 Using Balloon Help

On-line Help

The Norton Utilities for Macintosh come with an extensive on-line help system, available to users of both System 6 and System 7. Help is available for all of the Norton Utilities. The help system features an extensive topics index, a glossary, and several special features, including instant access to related information through underlined words or phrases. You can establish bookmarks, which give you quick access to information you consult frequently. A "see also" list of associated topics is also available for many terms and concepts.

Users of System 7 also have Balloon Help available. With Balloon Help enabled, a text balloon appears when you move the cursor over a Norton Utilities menu or menu item. This tells you what the menus and their commands are intended for. If menu commands are dimmed, Balloon Help tells you why.

When to Use

Use on-line help when you want immediate information about one of the Norton Utilities for Macintosh. You can also dig deeper into the Utilities using the on-line help. Help can be quicker and easier to consult that this User Manual.

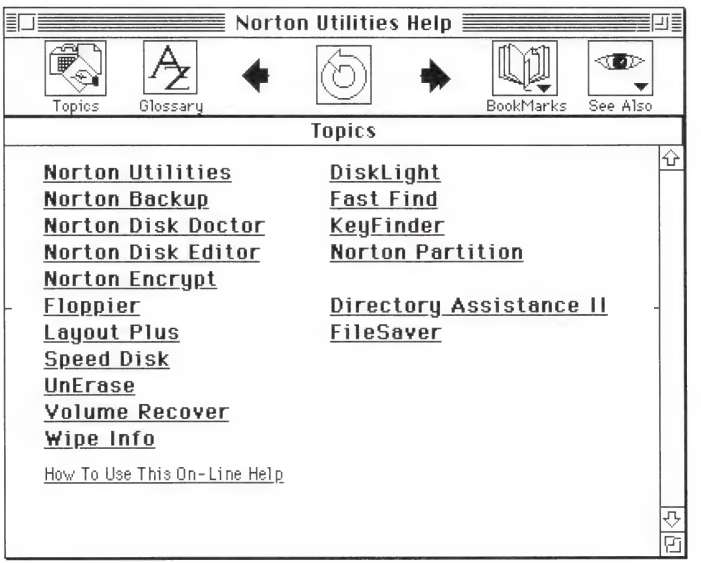
Use System 7 Balloon Help to familiarize yourself with the commands available in the Norton Utilities. Once activated, help is displayed immediately for all relevant commands without your having to lift a finger. You can turn Balloon Help back off again when you no longer need it.

How to Use

To access the on-line help, System 6 users should choose Help from the Apple menu. System 7 users choose Help from the Help menu, which is indicated by a balloon icon. The Norton help window appears.

Figure HE-1

The help window



At the top of the window are seven buttons. Click Topics to see a list of topics available in help. Click Glossary to see a glossary of available topics.

The two upper-right buttons access pop-up menus. Pull down Bookmarks to see a list of the current bookmarks; choose a bookmark topic to go directly to that topic. To clear a bookmark number, choose that number from the Clear Bookmark pop-up menu in the Bookmarks menu. To set an open bookmark to the topic currently shown in the help window, choose the appropriate number from the Set Bookmark pop-up menu. Pull down the See Also menu to see a list of additional topics relevant to the one shown in the window. Choose a topic to move immediately to it.

The three center buttons on the Help window, represented by a left arrow, a circled arrow, and a right arrow, control how you move in the topics list. The left arrow takes you back to the parent topic of the topic you're currently in. The circular arrow takes you back to the last topic you were looking at, whatever it was. The right arrow takes you on to the next topic in order.

Help information is shown in the scrolling area below the buttons. As you move the cursor over information, occasionally you'll see it change into a magnifying glass. This indicates that extra information is available for the topic under the cursor. This is called a *hyperlink*. Click with the magnifying glass to see information on the hyperlinked topic. To return to the original topic, click the circled arrow at the top of the help window.

Click the close box at the top-left of the window to exit on-line help.

Using Balloon Help

Users of System 7 have Balloon Help available for Norton Utilities menus and menu items. There is no Balloon Help for dialog boxes (including the features of Directory Assistance II), window items, or Layout Plus. Layout Plus is not needed in System 7, because the System 7 Finder has incorporated many of its features. Note that Norton Backup has Balloon Help available for items in its main backup and restore windows, as well as for its settings, file selection, and automatic backup functions.

To activate Balloon Help, choose the Show Balloons command from the Balloon Help menu.

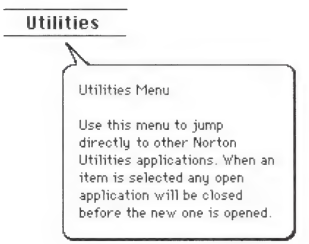
Figure HE-2

The Help menu

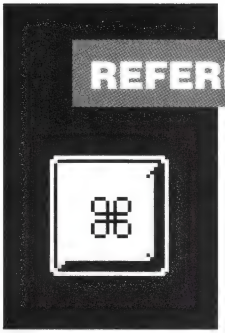
Thereafter, a text balloon will pop up when you move the cursor over an item for which Balloon Help is available.

Figure HE-3

The Help menu


Utilities
Utilities Menu
Use this menu to jump directly to other Norton Utilities applications. When an item is selected any open application will be closed before the new one is opened.

Some of this help is built into the finder, but other help is available for menus and menu items. To disable help, choose Hide Balloons from the Balloon Help menu.



KeyFinder

Contents

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R-59 When to Use
R-59 How to Use
R-61 Finding Special Characters
R-61 Verifying Keystroke Combinations
R-62 KeyFinder Menus
R-62 File Menu
R-62 Edit Menu
R-63 KeyFinder Menu

KeyFinder

KeyFinder is a desk accessory that displays all characters available in a particular installed font family, and simultaneously matches them with the keystrokes that produce them and with their ASCII values. It is especially useful in preparing foreign or technical correspondence where infrequently used characters and symbols are required.

When to Use

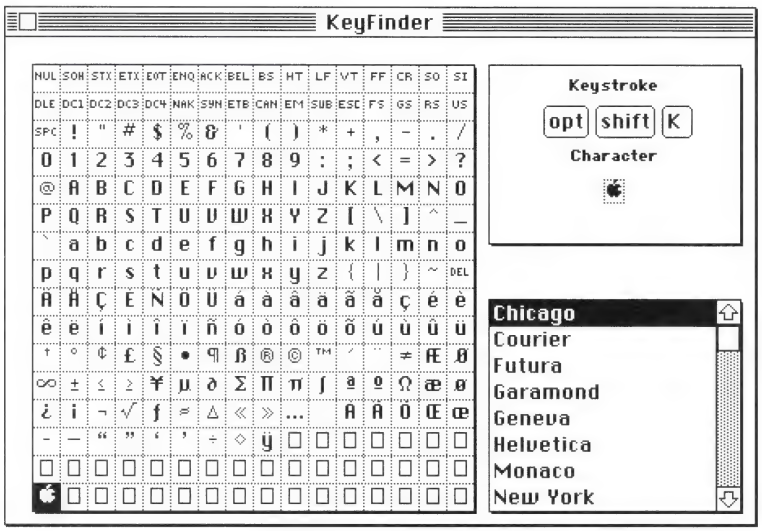
If you've ever wondered exactly how to produce the trademark symbol (™), much less a character with a diacritical mark such as *â* or a ligature (two letters written together) such as *æ*, you can now turn to KeyFinder for instant help. All characters available for a particular font are displayed simultaneously. If you're used to working with the Apple Key Caps desk accessory, you'll notice that with KeyFinder, you don't have to hold down modifier keys (such as the Command key) to see certain characters. In fact, KeyFinder displays some characters that Key Caps does not.

How to Use

KeyFinder is a desk accessory. It must be installed in your System file (or otherwise made available to it) before you can use it. The KeyFinder window appears when you choose KeyFinder from the Apple menu.

Figure KF-1

The KeyFinder window



A 16x16 table or matrix of characters occupies the left portion of the KeyFinder window. Blank cells in the table may represent a space, tab, or delete, or may have some other special significance. Rectangles inside certain cells of the table—called *missing symbols*—indicate that there are no character assignments for those particular keystrokes. You can either click on a cell to select it, or hold down the Option key and one of the arrow keys together to move across the table (in the direction of the arrow) to select the cell you reach. A cell is highlighted when selected. Notice that the solid Apple character is selected when you first open KeyFinder.

To the upper right of this character table is a box indicating the associated keystroke used to produce the character selected in the table, and a representation of the character contained in the table cell selected. Below this keystroke/character box is a scrolling font list indicating all installed fonts. In addition to clicking on the scroll bar to move up or down the list, you can also hold down the Command key and the Up Arrow together to move up the list or the Command key and the Down Arrow to move down the list. The currently selected font is highlighted. KeyFinder starts with the Chicago font until you choose another one.

Finding Special Characters

› **To find the keystrokes corresponding to any particular character:**

1. **Select a font by clicking its name in the font list.**
2. **Scan the table until you find the character you want.**
3. **Click the cell it occupies to display its keystroke equivalent in the box to the upper-right.**

Choose the Cut or Copy commands in the Edit menu to place the selected character into the Clipboard for later pasting into an application.

Verifying Keystroke Combinations

If you wish to verify that a particular keystroke corresponds to a certain character in a certain font, just type the keystroke with KeyFinder active with that font selected. Typing any keystroke combination will display the character produced regardless of the mouse cursor position. You can also paste in characters from another application to determine which keystrokes created them or to see what they will look like in another font. See the description of the Paste command below for more information.

It is not possible to enter the ASCII value to display the equivalent character or control code. Selecting a cell in the table or typing keystrokes are the only valid actions in KeyFinder.

Pressing Keys Simultaneously or In Sequence

Normally, the keystroke equivalent indicates that the keys shown are pressed *together* to produce the character selected. For example, to produce the ligature *æ*, you hold down the Option key and the single quotation mark key simultaneously. For some characters (with certain diacritical marks, such as *ä*), however, you'll need to press a *sequence* of keys. Such sequences are indicated by a space between two groups of keystrokes.

KeyFinder Menus

The KeyFinder functions are accessed through the following menus.

File Menu

- **Close**
  Exits KeyFinder.
- **Quit**
  Exits KeyFinder.

Edit Menu

- **Cut**
  Select Cut to cut text from KeyFinder into another application through the Clipboard. You must have the Text Edit option in the KeyFinder menu selected to cut text. You select text by positioning the blinking cursor (the insertion point) where you want to begin cutting, then clicking and dragging with the mouse to the end of your selection. Choose Cut to cut the selected text (which is highlighted) and place it into the Clipboard. It replaces any previous contents of the Clipboard and remains there until replaced. The selection vanishes and the cursor is repositioned to the beginning of the cut. Note that when you paste text that you have cut from KeyFinder into another application, it will not necessarily be in the same font as it was in KeyFinder; it depends on the application.
- **Copy**
  Copy acts almost exactly like Cut, except that it does not remove the text you've selected in KeyFinder. Use it when you want text to remain in KeyFinder and you want to use a copy of it elsewhere, too. You can copy a single character (when Text Edit is not selected) or a string of characters (when Text Edit is selected). Select text to copy the same way you do when using Cut (by clicking and dragging to highlight what you want to copy).

- **Paste**
  Paste inserts the contents of the Clipboard at the insertion point in the text edit box or, if the Text Edit option is not selected, into the single character box (if the contents of the Clipboard is a string, only the *last* character is pasted in). You can use this feature to paste in text you've copied or cut from other applications into KeyFinder to determine which keystrokes create specific characters in the text, or to see what the text looks like in another font.

  To verify the keystroke equivalent of a particular character you've pasted in from another application, move the cursor in the text box to the right of the character you wish to examine by clicking with the mouse while you hold down the Command key. You can also use the Left and Right Arrow keys to move the cursor while you hold the Command key down to display a character's keystroke equivalent.

  To see what a string of characters looks like in another font, first paste or copy the text into the text box from the other application, then select the font you want from the font list. The characters will appear in the chosen font automatically.

- **Clear**
  Clear removes text selected from the KeyFinder text edit box without placing it into the Clipboard.

- **Show Clipboard**
  (not available with MultiFinder): Choose Show Clipboard to view the contents of the Clipboard, where the last item you cut or copied is stored.

KeyFinder Menu

- **About KeyFinder**
  Gives copyright, version number, and developer information for KeyFinder.

- **Swap Orientation**
  Swap Orientation allows you to "rotate" the matrix of the table display.

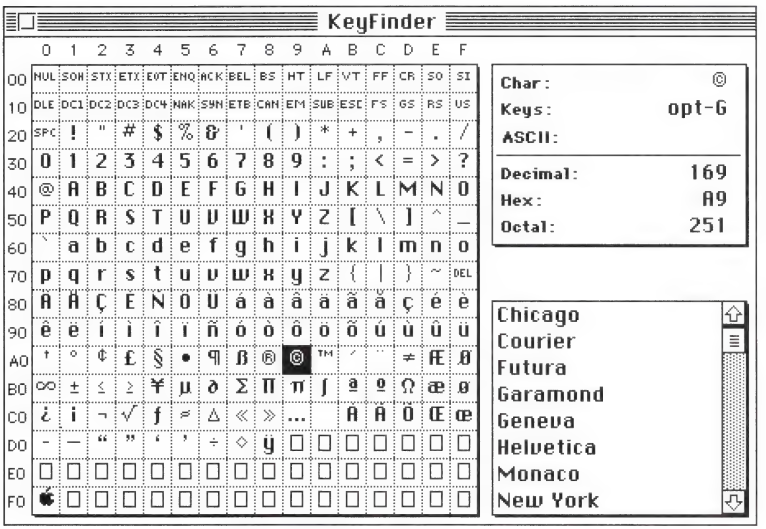
- **Show ASCII**
  This command allows you to view ASCII values and their keystroke equivalents for which there are no assigned characters in that particular font. For example, ASCII 13, which has no character associated with it but which indicates a carriage return, will be visible as CR with this option. With the Show ASCII option selected, KeyFinder will display the control codes (such as FF for form feed) for ASCII values 1 through 32.

- **Programmer Mode**
  Adds hexadecimal guides at the top and at the left of the character table, allowing you to locate a particular ASCII value quickly and see which character is associated with it.

  To determine the ASCII value in hexadecimal for a cell in the table using these guides, first select the cell with the character whose ASCII value you wish to obtain. Take the value on the *vertical* guide to the left of that cell and add it to the value above that cell on the *horizontal* guide at the top of the table. The sum is the ASCII value in hexadecimal for that particular cell. Normally, the table will be oriented so that moving from left to right across a row will increase ASCII values by one for each cell. If you select Swap Orientation, moving from one cell to another down a column will increment the ASCII values instead.

Figure KF-2

KeyFinder window in Programmer Mode



Before you start flexing your addition muscles and straining your eyes to read off the correct guide values, notice that the box to the upper right of the table changes when you select Programmer Mode to provide more information than usual. The top half of the box gives the usual keystroke equivalent (notice that a hyphen here indicates the two keys connected are pressed down *together*) and character representation. It also gives an ASCII name for special values (NUL, BS, and so on) whether the Show ASCII option is selected or not. In the bottom half of the box, the decimal, hexadecimal, and octal ASCII values that correspond to the table cell selected are displayed, allowing you to verify immediately that the ASCII value you calculated using the guides is correct for a particular cell. The guides are just there for quick navigation in the table.

- **Text Edit**
  This command displays a text box beneath the key-stroke/character box in which a string of characters may be shown instead of the usual one-character-at-a-time display. It can be particularly useful when you need to copy or cut a string of characters in the text box to

paste into another application. You can also use it when you want to paste or copy a string of characters into the text box from another application to determine which keystrokes created them or to see what they look like in another font. See the description of the Paste command for more information.

- **Font Size**
  This hierarchical menu lets you display characters within the keystroke/character box in a given font size when you click the character to magnify it. Characters in the text edit box (if active) and on the grid are not affected.

  Some fonts have different characters in different sizes. In such fonts, one character may be shown in the keystroke/character box while an entirely different character is shown in the grid and the text edit area. The character in the keystroke/character box is the correct one.

- **Page Setup**
  Choose Page Setup to bring up the standard Page Setup dialog box for your chosen printer. Typical choices include page size, orientation, and special printer effects (remember, font substitution is the default; if you don't have the correct printer font for the screen font you're viewing with KeyFinder, expect odd-looking results). You probably won't need to examine Page Setup every time you print a KeyFinder display, since certain choices such as page size and orientation are likely to remain the same. See your Macintosh system manual for more information about Page Setup.

  Be sure to set the default options in the Page Setup dialog box to disable font substitution. Deselect the Font Substitution checkbox.

- **Print**
  Select Print to print a particular KeyFinder display. A dialog box requesting the confirmation of several choices will appear. This dialog box will be the same as the one that appears when you choose Print from other applications. Only one page per KeyFinder display is printed.

- **Quit**
  Choose Quit to exit KeyFinder and return to the Finder or to the application that was active before you opened KeyFinder. (Remember that choosing Quit from the File menu while running MultiFinder quits *all* open desk accessories, not just KeyFinder.) KeyFinder will remember which options—Swap Orientation, Show ASCII, Programmer Mode, and Text Edit—are selected when you Close or Quit and will make sure they are selected when you open KeyFinder again.

Layout Plus

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Layout Plus

Layout Plus is an adaptation of the popular shareware program Layout, which allows you to make adjustments to the way the Finder displays the desktop. The font and size of the text drawn on the desktop can be changed, as can the icon spacing and many other settings.

Due to substantial changes in the Finder, Layout Plus does not work with System 7. Users of System 7 will find that virtually all of the Layout Plus features have been incorporated into the System 7 Finder.

Your custom display settings are saved within a copy of the Finder itself; they're used whenever that Finder copy is in control. (Although it isn't recommended, you can have more than one copy of the Finder on a disk. The Finder in your current startup disk's System folder—marked by a Macintosh icon—is in charge. You can also edit the active Finder in MultiFinder but you must restart your Macintosh system to see the changes.)

When to Use

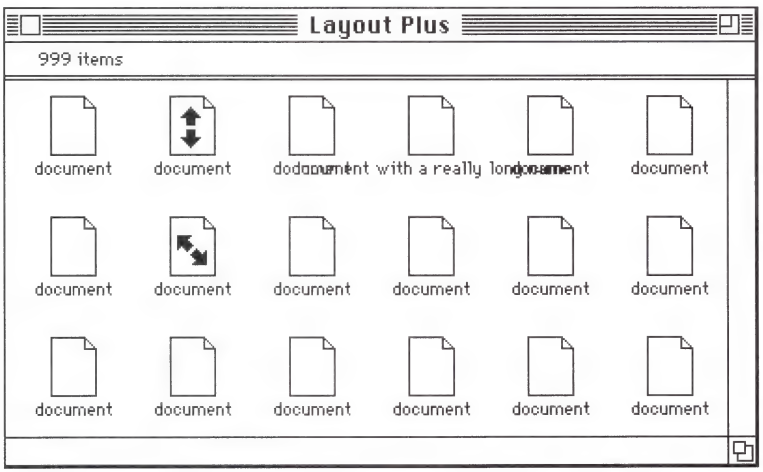
Use Layout Plus when you want to customize the appearance of the Finder. You can set the icon spacing within directory windows, and you can specify the type used to display document names. You can also control how the Finder behaves, including the number of windows that can be open at one time, the amount of time elapsed before the cursor changes to a watch, and more.

How to Use

All of the Layout Plus commands are contained within the menus. Certain commands open a directory window containing icons, columns of text, and so on. You click and drag these items to change their spacing.

Figure LO-1

The Layout Plus main window in icon view



Layout Plus Menus

Menu commands are as follows.

File Menu

- **Open**
  Allows you to select the Finder file you wish to modify. If you've made changes to a currently opened Finder, you're first asked if you want to save those changes.
- **Save**
  Saves changes you made to the Finder.
- **Revert**
  This command throws out any changes you've made, and restores the settings which were last saved in this Finder.
- **Restore All Defaults**
  This command restores the standard default settings of a "normal" Finder. It is useful if you want to undo all the changes you've ever made to this Finder and return it to normal.

Restore All Defaults restores all the settings. Many settings can also be changed to the standard defaults individually.

- **Copy From**
  This command lets you copy the layout from one Finder into another. It presents a file selection box where you can open a Finder other than the one you are working on. The settings for the Finder you're working on will be changed to duplicate the settings for the Finder you select. This is handy if you upgraded or reinstalled your system and Finder and you want to load in all your settings from an earlier Finder without having to change the settings one by one.

- **Quit**
  This command exits the program. If you made any changes, it gives you the chance to save them first.

Edit Menu

- **Undo**
  Cancels the effects of the last operation. This command toggles to Redo immediately after an Undo command, in case you want to "undo" that Undo command.

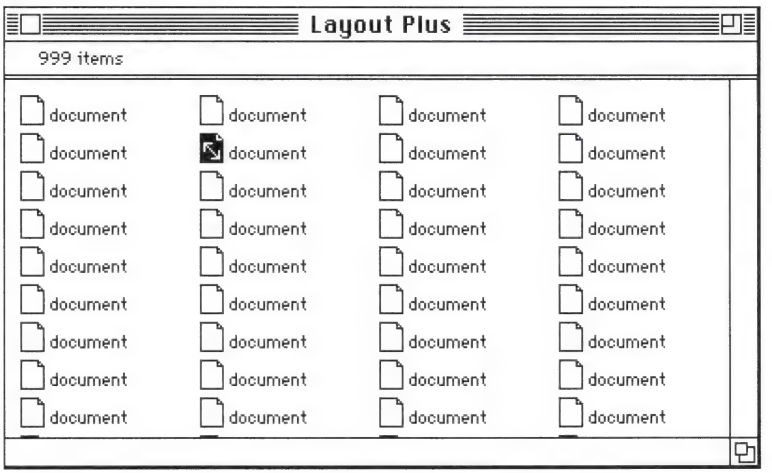
The remainder of the Edit menu is only active when a desk accessory is being used.

View Menu

- **by Small Icon**
  Selecting this command displays a grid of icons in the "by Small Icon" format. By dragging the arrow icon, you can set the horizontal and vertical spacing of the grid. This spacing will be used by the Finder whenever you issue a Clean Up command, when a new icon is created, and when a "gridded drag" takes place in a "by Small Icon" format window (see the Drag to Grid option in the Special menu).

Figure LO-2

Layout Plus main window in small icon view



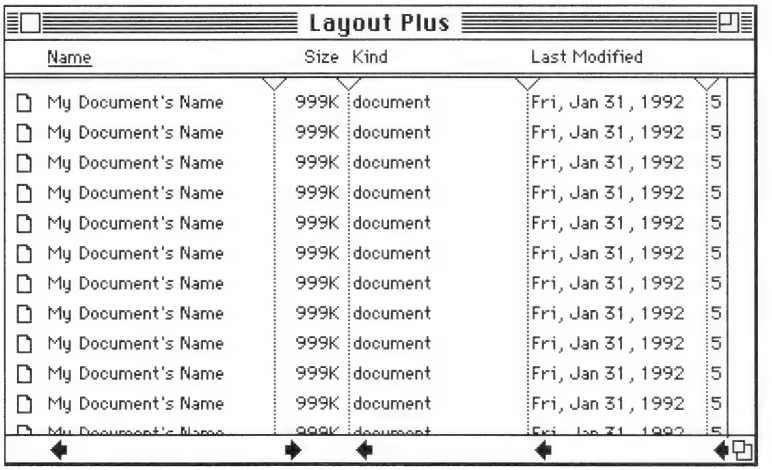
- **by Icon**
  This command is automatically in effect when the application starts. It displays a grid of icons in the usual "by Icon" format. You can adjust the grid spacing by dragging the icon with diagonal arrows, and the grid offset by dragging the icon with up and down arrows. (See Figure LO-1.)

  The grid offset vertically staggers the icons, allowing you to space the icons a bit closer together and still read the document titles. The grid you specify will be used when you choose the Clean Up command, perform a gridded drag, or when a new icon is created in a "by Icon" format window.

- **by Text**
  This command allows you to adjust parameters that control the windows displayed in the "by Name", "by Size", "by Date" and "by Kind" formats, as well as the printed output generated by the "Print Catalog" command in the Finder.

Figure LO-3

Layout Plus main window, text view



When you adjust the column spacing by dragging a dotted line, that line and those to its right are shifted over accordingly. The Finder truncates any text that is too wide for the column—an effect simulated by Layout Plus—so make sure the Size, Date, Time and other columns are wide enough. You cannot change the ordering of the columns or eliminate any of them.

Each column can be left- or right-justified; click the arrow at the bottom of a column to toggle between left and right justification. The format of the date can be set to short (12/25/87), medium (Thu Dec 25, 1987), or long (Thursday, December 25, 1987). The date cycles through the three formats when you double-click in the date column. You can also set the date format using the Date Format submenu described below.

The column by which entries in the text view are sorted ("Name" in View by name, "Kind" in view by Kind, and so on) is displayed according to the settings checked in the Style menu. Some early versions of the Finder don't have this option and in those cases the menu will remain disabled.

- **Change Window Size**
  This command displays a window that controls the position and size of new windows created by the Finder.

- **Default View**
  A dialog box with options for setting the default view in which a newly created window will appear (icons, small icons, text, and so on).

- **Use Default Spacing**
  In icon view (Spacing) or in a text view (Tabs), causes the display to revert to the default settings for space between icons or between columns of text.

- **Lock to Grid**
  When this command is checked, the adjustments you make to the icon spacing in the Small Icon View and Icon View are snapped to an invisible grid. To make fine adjustments to the spacing, remove the checkmark. This command is not related to the Drag to Grid command described below.

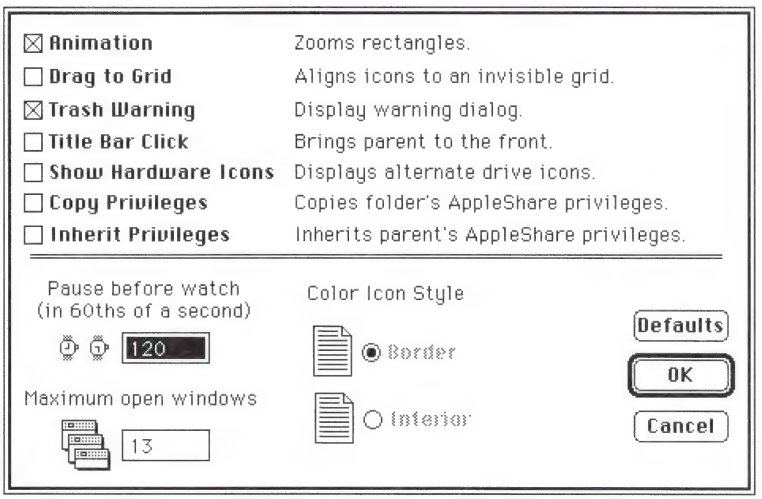
- **Date Format**
  A submenu with options for specifying the date in text view.

Special Menu

- **Options**
  Choose this command to bring up a dialog box in which you can specify a number of Finder settings, controlling both how your desktop appears and how the Finder behaves.

Figure LO-4

The Options dialog box



- **Animation**
  This command is normally checked, which means that the usual zooming effect will take place when the Finder opens a window or an application. If you remove the checkmark, the Finder will not use the zooming effect.

- **Drag to Grid**
  This c ommand is normally not checked, which means you can position icons freely on the desktop. If you check this item, whenever you drag an icon it will snap into position on the grid automatically without having to do a "Clean Up."

- **Trash Warnings**
  If this command is checked the Finder will warn you as usual whenever you throw an application or System file into the trash. With this option unchecked, the Finder displays no such warning, which is potentially risky. Of course, if you find out soon enough that you've made a mistake, you can use UnErase.

- **Title Bar Click**
  When checked, this command causes a window's parent window to come to the front when you double-click the first window's title bar. The parent window contains the folder that the original window represents.

- **Show Hardware Icons**
  Rather than showing disk icons (some specific to the brand or manufacturer), this option displays alternate hardware-based icons of the drives themselves.

- **Copy Privileges**
  Copies a folder's AppleShare privileges when a copy is made of the folder. (Also copied are the folder's size, location, and default view.) This can have an unexpected side effect. If you create a new folder on a file server, you may not be able to access it because you may not be the owner. Whoever owns the parent folder is the actual owner.

- **Inherit Privileges**
  Copies the parent folder's size, color, view, and AppleShare privileges when a new folder is created. This option can have the same unexpected side effect as the Copy Privileges command.

- **Pause Before Watch**
  This allows you to adjust how long to wait before the Finder will display a wristwatch cursor with animated hands during such lengthy operations as file copying. The time is expressed in 60ths of a second. If you make it too short, the cursor will jitter and change shape too often.

- **Maximum Open Windows**
  This allows you to set the maximum number of windows the Finder can open at one time. Increasing the number of windows causes the Finder to need more memory. When using MultiFinder, you may have to increase the memory allocation for the Finder.

- **Color Icon Style**
  Color Icon style and the color palette are separate features. Color Icon Style allows you to specify the interior or border color of your icons. Color Palette allows you to change the colors that appear in the color menu in the Finder (if your computer has color available).

Buttons

Defaults: Restores the default Finder settings.

OK: Confirms changes and leaves the dialog box.

Cancel: Cancels changes and leaves the dialog box.

Font Menu

By selecting a font name from this menu, you will change the font of most text displayed by the Finder. This includes the icon titles, the window top margin text, all the text in the Text Views, and the printed text generated by "Print Catalog". A check is placed next to the font the Finder will use, unless that font is not in the current System file.

The font names displayed are those which are installed in the current System. If you later change the System fonts or use the Finder with a different System file, the font you specified may be missing. In that case, the default font will be used.

Size menu

This menu displays the available font sizes you can set the text to. Font sizes which are installed in the current System file for the checked name in the Font menu are highlighted. If you later use the Finder with a different or modified System, the size may not be available and a scaled font will be used.

Style menu

This menu is active when the Text View is being displayed, except when using an older Finder. It adjusts the style of the heading of the column by which the view is sorted. See the section on "Text Views" above for more information.

REFERENCE

Norton Backup

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Norton Backup

The Norton Backup is an easy to use, powerful backup tool that helps protect your valuable information from loss. With the Norton Backup you can back up files from one or more volumes to floppy disks or to a file on any mounted volume. Options include data verification, file compression, error correction codes, automatic scheduling, and automatic disk formatting.

See Chapter 3, "Performing Everyday Operations" for quick steps on creating a new backup.

When to Use

You choose the frequency. It's a good idea to maintain a backup cycle that will ensure complete protection of your files. Not all files require the same safety precautions–some files may need to be backed up every day, others once a month. Because Norton Backup can perform *intelligent* backups, you can schedule daily backups, and only new or changed data will be added to the backup file.

How to Use

You can make backups to floppy disks, to another volume or to a file. The collection of files you include in one backup session is called a *backup set*. You can create different backup sets for different needs.

Starting Norton Backup

You can start Norton Backup in different ways:

Norton Backup

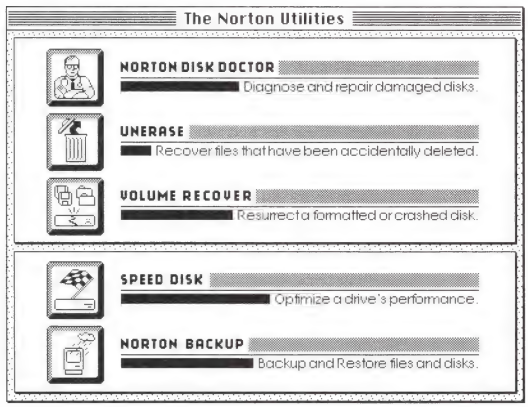
- **In the Finder**
  Double-click the Norton Backup icon in the Norton Utilities folder.

OR

Daily Backup-Monday

Double-click a backup description file icon if you've created one. Norton Backup stores this file in the Norton Utilities folder unless you've specified a different location.

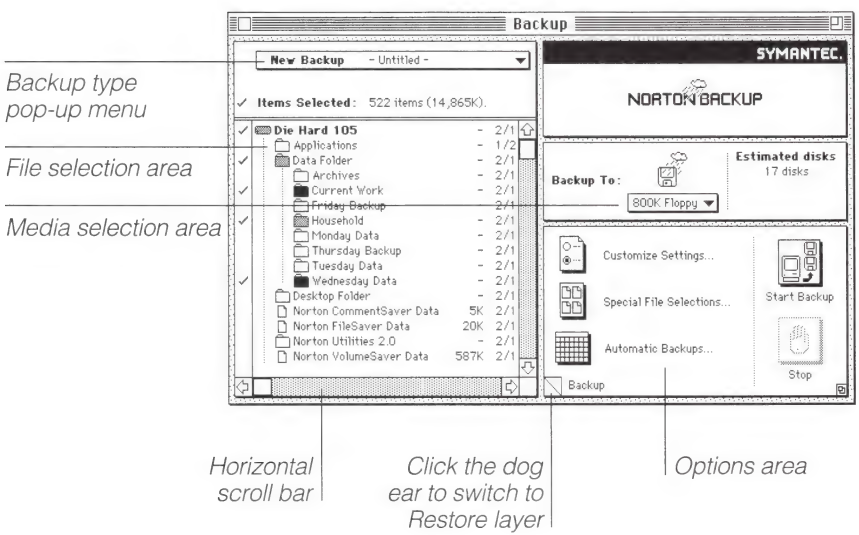
- **From within Norton Utilities:**
  Click the Norton Backup button on the Main Menu.



7 Drag a backup description file icon to the Norton Backup application icon.

The Backup window appears on the desktop.

Figure NB-1
Backup window

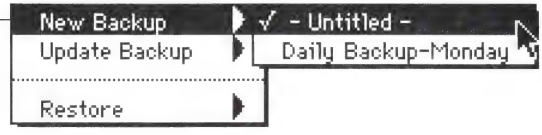


About the Norton Backup window

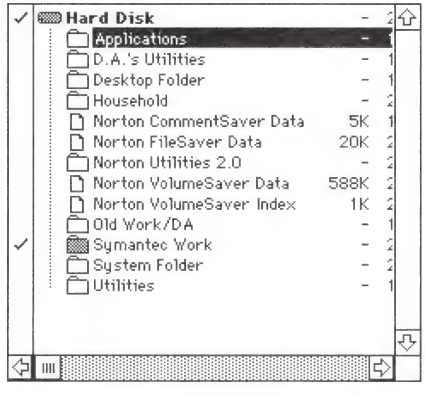
The Norton Backup window has two layers, Backup and Restore. You click the dog-ear to switch to the Restore layer. Both layers share these elements:

- **Backup pop-up menu**
  Here's where you to choose the type of backup (new or update), choose a backup description file, or choose a Restore file or other activity. You drag horizontally to choose an option from the menu.

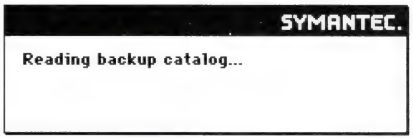
Press and drag horizontally



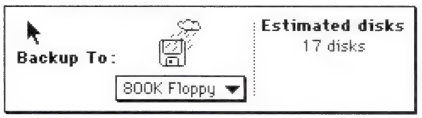
- **File selection area**
  You can select files by volume, folder, individually, and by using the special file selections. Use the horizontal scroll bar at the bottom to see hidden columns to the right. The left column contains checkmarks beside volume, folder, and file icons that have been (or contain files that have been) selected for a backup or restore activity.



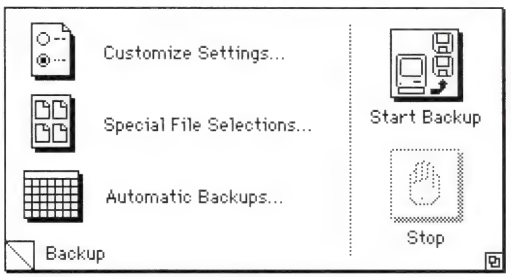
- **Message area**
  Displays messages that tell you how to proceed, and shows backup progress and other Norton Backup activity.



- **Media area**
  Use the pop-up menu to choose the type of media to use for the backup set. This area also displays the estimated time and media figures during backups and restores.



- **Options area**
  The Customize Settings, Special File Selections, and the Scheduler are all accessed from the Options area.



Types of Backup

There are two types of backups: New and Update. New backs up all selected folders and files. Update backs up selected folders and files that have changed, and any new files that are within the selected folders. In either case, you create the backup by selecting files, choosing options, and (if you want) scheduling backup events.

Network Information: Norton Backup can back up to and from AppleShare, TOPS, and Novell networks. If the owner and group names are defined for the files that are being backed up, the files will be restored with their permission settings intact. If Norton Backup is unsure that it is restoring the files to a server with the same user and group settings, it restores the files without the permission settings. See Appendix D for more information.

Creating a New Backup

A new backup only affects the files that you have selected. You do not have to back up your entire volume.

Before you start:

- If you are backing up a partition, be sure to mount the partition before you back it up.
- If you are backing up to floppy disks, make sure that you have enough disks to hold your backup set. Once you have chosen the files and the type of backup media, Norton Backup estimates the number of disks you'll need.

Summary Steps

The following steps summarize the new backup process. Detailed procedures are provided after the summary.

Before you begin, gather together enough floppy disks and labels to complete the backup. If you are not sure how many you need, look at the estimated figure in the media area after you have selected the folders and files that you want to back up.

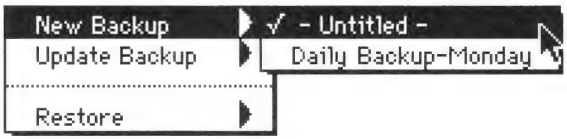
Begin with the Norton Backup window active.

1. **Choose New Backup from the Backup pop-up menu.**
2. **Choose a media type from the Backup To pop-up menu.**
3. **If you wish, click the Customize Settings button to select any General and Backup Options.**
4. **Select the files, folders, or volumes for this backup set by clicking in the checkmark column to the left of the file list.**
5. **Click the Start Backup button.**
6. **Click Done when you see the "Backup Complete!' message.**
7. **Click the close box, or choose Quit from the File menu.**

Full Steps

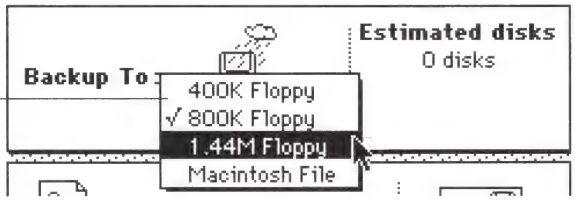
1 Choose the type of backup (New Backup) and the name of the backup description file (Untitled.)

Press the pop-up menu and drag to the right to display available backup description file names.



2 Choose the type of backup media.

Choose the size of floppy disk or choose Macintosh File from the pop-up menu in the media area..



Backup media pop-up menu

Norton Backup supports 400K, 800K, and 1.44 MB floppy disks, or you can back up to a Macintosh File. In either case, your data may be compressed. Norton Backup initializes floppy disks automatically.

If you are using 400K floppy disks and really want to save space, the Special File Selections options may reduce the number of disks you need. For example, you can choose Exclude Applications *and* Exclude System Files. *You can always reinstall the applications from the original program disks if necessary.*

If you do not have a 1.44MB drive installed on your Macintosh, the 1.44MB Floppy Disk item is not listed in the Backup To pop-up menu.

Current work backup

- **If you choose a Macintosh File**
  Backing up to a file is fast and convenient, but riskier than backing up to floppy disks. If the volume holding the file crashes or has serious problems, you may have difficulty recovering the backup description file.

It's a good idea not to use the Macintosh File media type for your main backup routine unless you are backing up to a file on a network server that in turn has a secure backup routine.

You can back up to a file on any mounted volume, including network volumes. The entire backup is contained in a single file (if it is 256MB or less.)

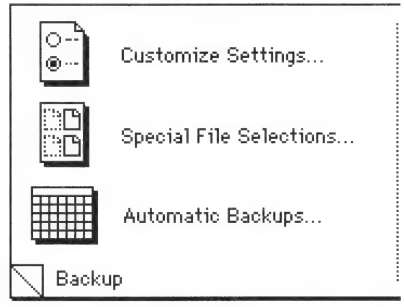
Figure NB-2

Norton Backup file types

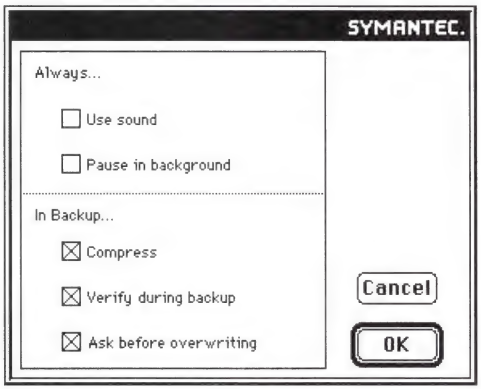
Daily Backup-Monday

Daily Backup-Monday #001

3 Select customized settings.
Click the Customize Settings button.



The Options dialog box appears.



The following setting options are available in every layer:

Use Sound: Your Macintosh alerts you with a beep whenever you need to perform an action.

Pause in Background: (MultiFinder or System 7) Norton Backup pauses when you put it in the background, and resumes when you return it to the front.

If this option is *not* selected and you operate Norton Backup in the background, overall system performance may be slowed down.

If you are backing up to floppy disks with Norton Backup in the background, it will eject each disk and continue when you insert the next disk. If Norton Backup needs your attention it will alert you with a small blinking icon in the upper right corner of your screen.

The following options are also available:

Compress: Norton Backup analyzes your files and compresses them wherever possible. How much compression can be achieved depends on the type of file you are backing up. A high compression percentage can be achieved when compressing normal applications or documents, but not when files are already compressed by utilities such as Compact Pro®, Stuffit®, or Disk Doubler®.

Verify During Backup: Protects your files from being saved to a bad floppy disk. Norton Backup checks each block after it is written to the destination medium. (A block is a unit of information that has a predetermined size.) The files on the destination medium are read to make sure there were no physical recording errors, and then the files are compared to the hard drive. The backup may take a little longer, but the security is worth the extra time.

As an extra precaution, after backing up, use the Verify Only option in the Restore layer to verify backup files that are extremely valuable.

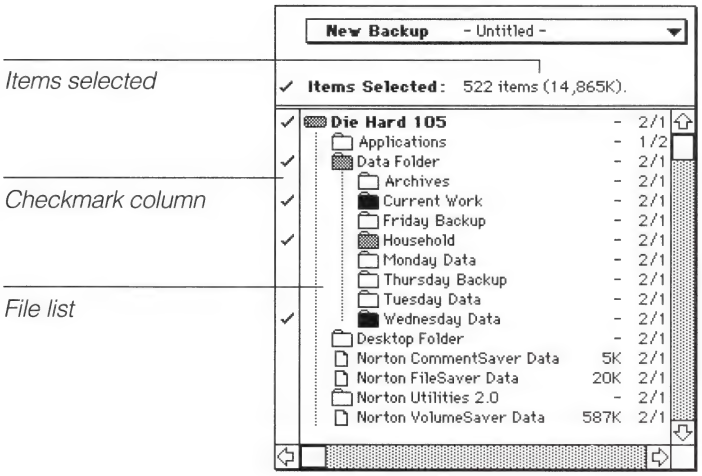
Ask Before Overwriting: Norton Backup prompts you before overwriting any floppy disk that contains existing files.

4 Select files, folders, volumes

To select files, folders, or volumes in the file list, click in the checkmark column to the left of a file icon. You can also click a name or icon to highlight it and press the Space Bar.

To select groups of files by date or by certain file types, click the Special File Selections button and select options in the Special File Selection dialog box.

The file selection area includes the following elements:



- **Items Selected**
  This line, above the file list, displays the number and size of the items currently selected for backup. It keeps a running total as you select or deselect files from the backup set.

- **Checkmark Column**
  The Checkmark column is located to the left of the file list. When you move the pointer over this column the arrow turns into a checkmark and you can select files by clicking in the column. Click again to deselect a file. You can also highlight a file name and press the space bar to select or deselect it.

- **File List**
  The file list displays all known volumes. Double-click a volume or folder icon to expand it. The volumes that are part of the currently selected backup set are indicated by gray or black icons.

  To display files in a different order, such as by date or size, choose a command from the View menu. Norton Backup is preset to display in alphabetical order.

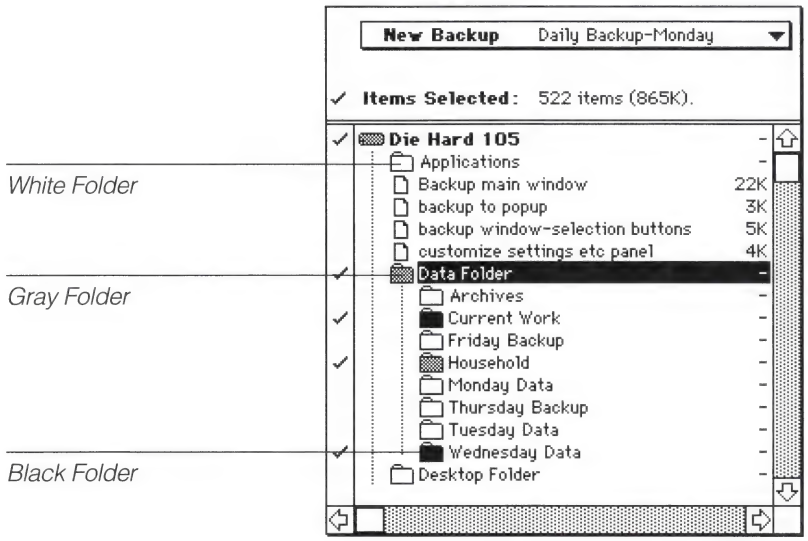
  To move quickly through large file lists, choose a command from the Selections menu. For more information on the View and Selections menus, see the "Menu Commands" section later in this chapter.

- **Volume, Folder and File Icons**
  The volume, folder, and file icons change appearance to indicate their backup status.

  White volume, folder, or file icon: The file, folder, or volume (and its contents) is not part of the backup set.

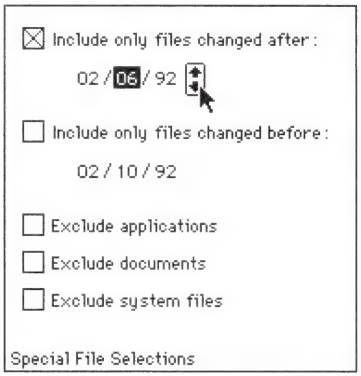
  Black volume, folder or file icon: A black *file* icon indicates that the file is selected as part of the backup set. A black folder or volume icon indicates that all contents are part of the backup set.

Gray volume, folder or file icon: A gray file icon indicates that the file already has been backed up and it is selected for backup. A gray volume or folder icon indicates that some files *within* the volume or folder have been selected for backup. For an update, a gray icon means that some files and folders already have been backed up.



■ **Special File Selections**

You can use the Special File Selections to narrow your selection more easily. For example, select the Exclude Applications and reduce the number of floppy disks required for the backup set. Since you normally have the original application disks, you can reinstall the applications if necessary. Below is a description of what each selection does:



Include only files changed after: Only the files changed on or after the displayed date are included in the backup.

Include only files changed before: Only the files changed on or before the displayed date are included in the backup.

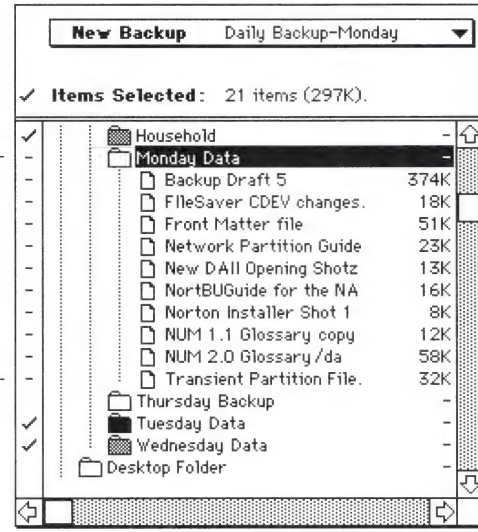
To change a date, click to select the month, day, or year, and press the up or down arrow.

Exclude applications: All applications are excluded from the backup.

Exclude documents: All documents are excluded from the backup.

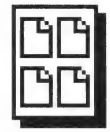
Exclude system files: System files are excluded from the backup. This includes all Apple System files as well as any desk accessories and other startup documents. However, there are a few applications and files that are always backed up even if this checkbox is selected. Applications such as TeachText, and a few files that are related to saving preferences are always backed up.

When a folder or file is excluded from the backup with a special file selection, a dash appears in the Checkmark column opposite the file's icon.



Dash indicates file has been excluded

When you have made special selections, the Special File Selections button changes its appearance:



No special selections made

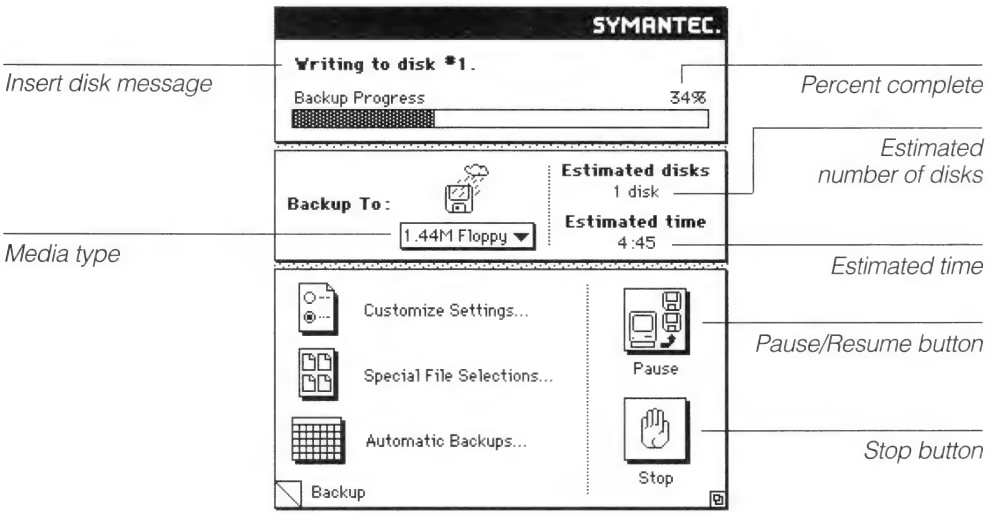
With special selections made

After you have applied one or several of these special selections, you can still add or delete files (but not folders or volumes) from the file list. Clicking in the file list *always* overrides the special file selection. For example, if you have selected Exclude Applications, but also select the GreatWorks application in the file selection list, GreatWorks will be included in the backup.

You cannot restore copy-protected applications, you must reinstall them.

5 Click the Start Backup button.

Once you click the Start Backup button, Norton Backup reports its progress.



During the backup, the file list shows only the volume, folders, and files that are being backed up. You can watch the progress, elapsed time, and percent complete in the message area. Norton Backup will prompt you to insert floppy disks until the backup is complete.

As you remove each floppy disk, number and label it with the backup description file name.

Pause

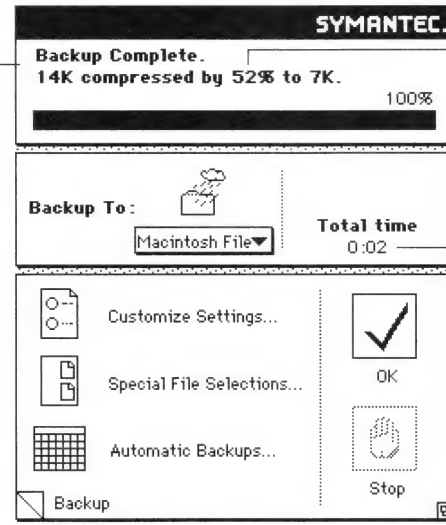
Click the pause or stop button if you need to interrupt the backup.

While the backup is in progress, the Start Backup button becomes a Pause button. When you click Pause, the button changes to Resume.

Stop

You can click the Stop button at any time to cancel the backup.

Norton Backup reports when the backup is complete.



Summary report of completed backup

Percent compression

Elapsed time

6 Click Done when the backup is complete.
You return to the Backup window.

7 Click the close box, or choose Quit from the File menu to leave Norton Backup.
To go to another utility, choose from the Utilities menu.

Updating a Backup

When updating a backup set, Norton Backup includes only the files that have changed since the last new backup or update, plus any new ones that you want added. This type of backup is convenient for daily backups because it does not require much of your time.

You select the backup set you want to update by choosing the backup description file from the Backup pop-up menu. Then you select additional options and files if you want.

Norton Backup updates a backup set by appending new or changed information to the end of the backup file set. That's why you need to have the last floppy disk of your backup set ready before you start your update.

Summary Steps

The following provides an overview of the steps required to complete an update. Detailed procedures for using each part of the backup process are provided after the summary.

If you are backing up to floppy disks, make sure to have the last floppy disk in the backup set ready.

Start with Norton Backup on the desktop.

1 Choose an available update file from the Backup pop-up menu.

2 Change the settings of any options if you want.

3 If you wish, select additional folders and files to be backed up.

4 Click the Start Update button to begin.

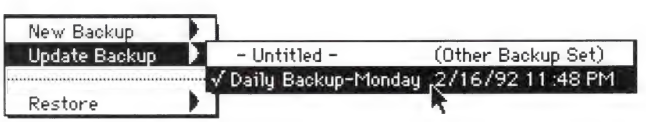
5 Click Done when the backup is complete.

6 Click the close box or choose Quit from the File menu to leave Norton Backup.

Full Steps

Here's a detailed description of the update steps:

1 Choose an update description file from the Backup pop-up menu.
Press the pop-up menu to display the Update Backup item, and drag the pointer to the right to choose the backup description file that you want.

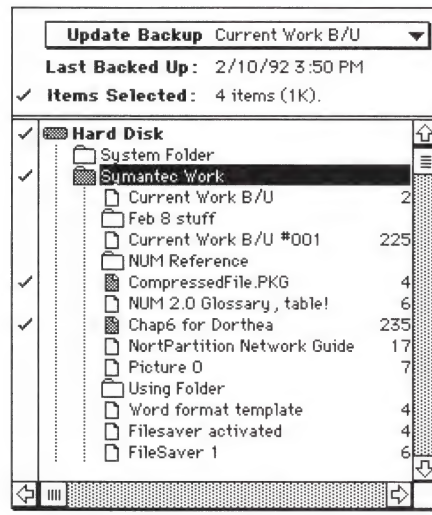


2 Change the settings of any options if you want.
Click the Customize Settings button. A dialog box appears where you can change settings.

For a complete description of file selection and special options, see "Creating a New Backup" earlier in this chapter.

3 Select files.
Norton Backup automatically selects files that have changed since the last complete or partial backup. You see which files these are by looking in the file list. The appearance of the folder or file's icon (white, gray, or black,) shows its status.

You can add files, folders, or volumes using the file selection techniques discussed in the New Backup section earlier in this chapter.



Norton Backup tells you when the catalog was last modified, the number and size of the items currently selected for backup, and, in the file list, displays the number and size of the items that will be backed up during the current session.

When you use Update, notice that all of the files in the backup set have checkmarks next to them. Checkmarks do not indicate that a file is going to be backed up during the current session. They indicate that the folder or file is part of the backup set. Whether or not a file is going to be backed up is indicated by the appearance of its icon: white, gray, or black.

Before you start the update, make sure that you have the last floppy disk from the backup set you're updating, and more floppy disks and labels if necessary. If you are not sure how many you will need, look at the Estimated Disks figure in the Media area.

4 Click the Start Update button.
Once the update begins, Norton Backup shows its progress in the message area, and prompts you to insert floppy disks when needed. You can click the Pause or Stop buttons to interrupt or cancel the update.

When the update is completed, Norton Backup gives you a summary report in the message area.

5 Click Done when the update is complete.
You return to the Backup window.

6 Click the close box, or choose Quit from the File menu to leave Norton Backup.
To go to another utility, choose from the Utilities menu.

Scheduling Regular Backups

Once you have decided on a backup cycle, you will want the procedure to be as fast and easy as possible. With the Scheduler you can automate your backup cycle and save yourself a lot of time. The Scheduler can be used to perform unattended backups (if you're backing up to a file), or to remind you to perform your backup.

When it is time to run a scheduled backup, Norton Backup will automatically take over. If using floppy disks, it will start, choose the appropriate backup description file, and then wait for you to respond to the prompts. If you are backing up to a file on a network, make sure that you are logged on to the network.

When a scheduled backup is complete, Norton Backup will automatically quit.

About the Norton Backup Extension

When you install Norton Utilities for the Macintosh, an extension file for the Scheduler will be placed into your System Folder. Norton Backup's system extension is called the *Norton Backup Extension*, and its icon resembles a clock.

In System 7, the extension is placed into your Extensions folder during the installation procedure.

Scheduling Events

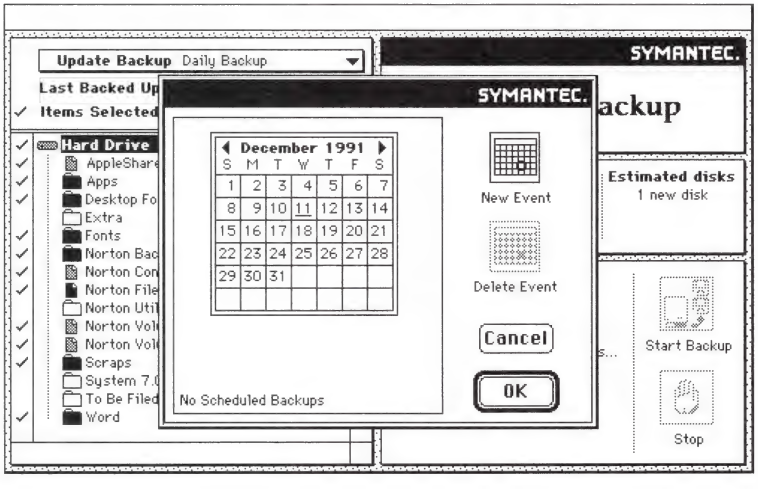
A scheduled backup is called an event. Once you've scheduled an event, Norton Backup starts at the scheduled time. If the Scheduler cannot start your backup at the scheduled time, for whatever reason, it will continue to attempt to run the backup periodically.

To schedule and start events, the Scheduler relies on the Macintosh's internal clock for the correct date and time. Make sure that this information is correct or your events will not start when you expect them to. To change or set your Macintosh's date and time, refer to the manuals that came with your Macintosh.

To access the Scheduler you must be in the Backup layer. Choose the backup description file that you want to schedule the event for, and then click the Automatic Backups button. The Scheduler dialog appears on the Backup layer.

Figure NB-3

The Scheduler allows you to automate your backup cycle.



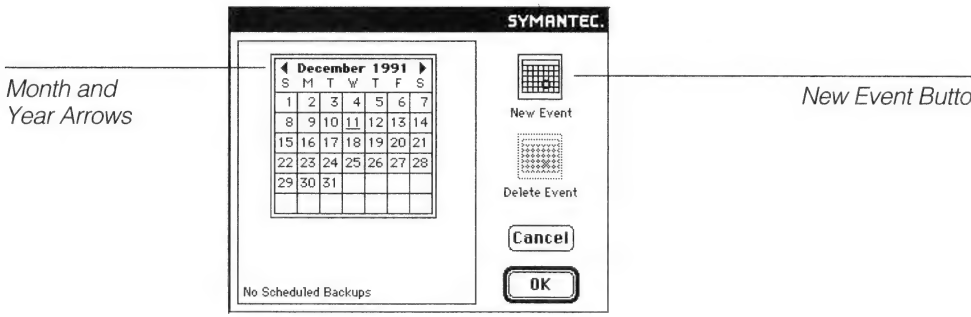
When you set up an automated backup in the Scheduler, it is called an *event*. You can set up more than one event per backup description file if necessary. For example, you could create one event to perform a New backup type monthly, and one to perform an update daily.

Using the Calendar

The Scheduler's calendar allows you change the month and year by clicking the arrows on either side of the month and year title area. Clicking the arrow on the right changes the calendar to future months and years, and clicking the arrow on the left changes the calendar to past months and years. When the Scheduler is first opened, the calendar is set to the current month and year, with the current day underlined.

Figure NB-4

The calendar displays the current month as well as future and past months.

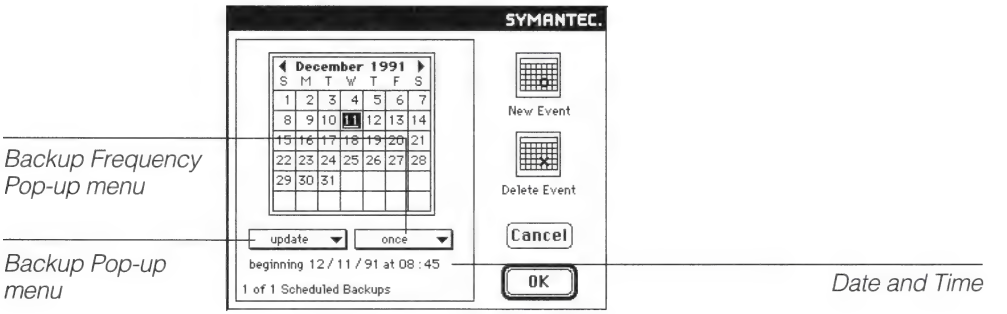


Once you click the New Event button, you can select an individual day for the event to happen (for example, every Friday), by clicking next Friday's date on the calendar. When a day is selected, it turns black to indicate that it has been selected.

The first step in scheduling an event is to click the New Event button. The Scheduled Backup page appears in the dialog with the following components:

Figure NB-5

The New Event button displays the Scheduled Backup page



- **Backup pop-up menu**
  You can choose to perform either a New or an Update backup.

- **Backup Frequency pop-up menu**
  You determine how often the event will occur by choosing an option in the Backup Frequency pop-up menu. The available choices are: Once, Hourly, Daily, Weekdays, Weekly, and Monthly.

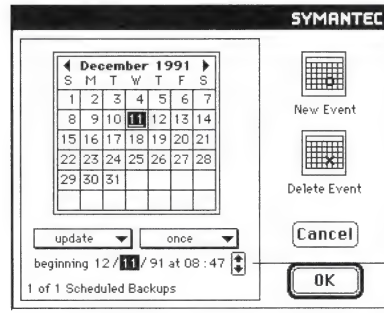
- **Date and Time**
  The date and time display found below the Backup and Frequency pop-up menus displays the date and time that an event will begin. There are two methods that you can use to change the date and time that the event will occur:

  Click the date in the calendar to update the date display (this is not true of the time display).

  Click any part of the date or time in the display below the pop-up menus. When you've selected the date or time element you want to change, click the up and down arrows to change the element.

Figure NB-6

Click the Date and Time arrows to adjust the date and time of the scheduled event.



Viewing Events

To view events that have been set up for the current backup description file, click the dog-ear at the bottom of the Scheduled Events pages. The current event is highlighted, while other events such as full backups are represented with a gray border. If no events are scheduled, the message "No Scheduled Backups" appears at the bottom of the dialog box.

Deleting Events

You can delete the currently displayed event by clicking the Delete Event button.

Restoring Backup Files

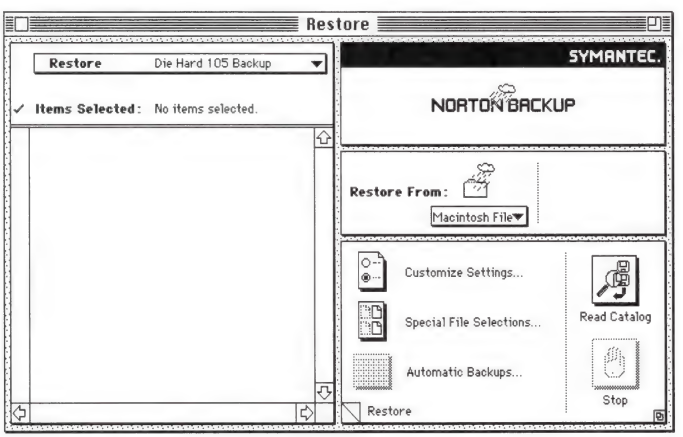
Norton Backup's Restore feature reads the backup description file and restores the files to a location that you specify.

Start with Norton Backup on the desktop with the Restore layer active. (Click the dog-ear in the lower left corner of the Options area to switch from the Backup to the Restore layer, or you can select Restore from the File menu.)

Network Note: When Norton Backup restores network files, the owner and group names must have been defined for the files that were backed up. Only then will the folders be restored with their permission settings intact. If Norton Backup is unsure that it is restoring folders to a server with the same user and group settings, it will restore the files without the permission settings.

If you are restoring files to a partition, be sure to mount the partition before you restore the files.

If you have not already done so, find the backup set that you are going to restore.



Summary Steps

Here's a summary of the steps in restoring a backup. Detailed procedures for using each part of the restore process are provided after this summary.

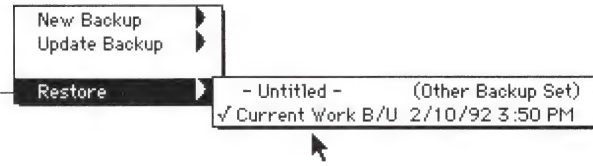
1. **From the Backup pop-up menu choose the backup description file you want to restore.**
2. **Click the Customize settings button and select options in the dialog box.**
3. **Select the files that you want to restore.**
4. **Click the Start Restore button to begin.**

5 Click Done when the restore is complete.

6 Click the close box, or choose Quit from the File menu to leave Norton Backup.

Full Steps

1 From the Backup pop-up menu choose the backup description file you want to restore.
The Restore option is on the Backup pop-up menu, in the upper-left of the window.



Backup Pop-up menu: Restore selected

(Make sure you are choosing a file from within the Restore hierarchy. If you choose a backup file from Update or New Backup, Norton Backup will switch back to the Backup layer.)

When you select a backup description file, Norton Backup reads the catalog and displays the appropriate volumes in the file selection area. Only the folders and files in the selected backup set are displayed when you expand the volume.

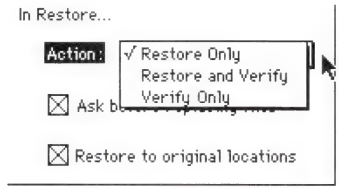
2 Click the Customize settings button and select options in the dialog box.
The Use Sound and Pause in Background options operate the same as in the Backup layer.

In the Customize Settings dialog box, there are three options unique to the Restore process. They are:

- Action pop-up menu
- Ask before overwriting files checkbox
- Restore to original locations checkbox

Action pop-up menu: This menu has three choices:

- Choose Restore Only to restore from the backup set without verifying data.



- Choose Restore and Verify to ensure that the backed up information was restored to your hard drive without errors. Use this option if you suspect that you are having problems with your hard disk. Your files are restored from the backup set and then immediately checked to make sure that the data was written correctly to the hard disk.
- Choose Verify Only to have Norton Backup compare your files to their hard disk counterparts. You are notified if the selected files no longer contain the same information as their backup set counterparts, or if they no longer exist on the hard drive. When a discrepancy is found, Norton Backup gives you the option to continue or cancel the verification procedure.

This is the most reliable verification. Use it whenever you are backing up very important files or when you are archiving information.

Ask before replacing files: This option prevents your data from being accidentally overwritten. When this option is selected, you will be prompted before a file on your hard disk is overwritten during the restore process.

If Norton Backup finds a file that already exists on the hard drive when restoring to the original location, it will display a dialog box that presents you with the following options:

- Skip (do not replace) the file
- Replace the file with the version on the backup set.
- Skip all the duplicate files that are found.
- Replace all the duplicate files with the versions on your backup set.
- Cancel the whole restore procedure.

Restore to Original Locations: This option allows you to restore your files to a location other than the original location. When this option is selected, your files will be restored to their original location. When this option is deselected, Norton Backup displays a dialog box in which you enter an alternate location for the restored files. This dialog box will also appear if Norton Backup cannot find the original volume.

3 Select the files that you want to restore.

The file selection area lists all the files in the current backup set. You can restore all files in a backup set or just a few.

Select the files to be restored by clicking in the checkmark column next to the name of the file or folder, and by using the options in the Special File Selections dialog box.

Tracking Files and Folders: During the update backups that you perform as part of your backup cycle, Norton Backup keeps track of changes to folders and files. The folders and files that have changed are marked with a slash. Norton Backup stores this information in the backup description file and marks the icon when it notes that a file is deleted from your hard drive, a file or folder is moved to a new location, and when a file or folder is renamed during the backup cycle.

When Norton Backup determines that one of these changes has occurred, it marks the older version as obsolete by placing a slash on the icon. The slash alerts you that you have the opportunity to decide whether or not to restore the file. For example, if a file is in the "Letters" folder on Tuesday's update backup, but in the "Invoices" folder on Wednesday's update backup, then Norton Backup will mark Tuesday's file because it is the older version.

In order to make file selection easier, Norton Backup assumes that you don't want to restore the older versions of files. A file that has a slash will not automatically be selected when you select the folder (this is also true on a volume-to-folder level). But you can select the file or folder manually.

For more information on selecting files, see the New Backup section earlier in this chapter.

You cannot restore copy-protected applications, you must reinstall them.

Before you press the Start Restore button, make sure that you have the most current backup set ready. If restoring from a floppy disk backup set, you will be prompted to insert the floppy disks as needed.

4 Press the Start Restore button.
The Start Restore button in the Options area initiates the restore process.

During the restore, the file list is replaced with one that shows only the volume, folders, and files currently being restored. The message area displays the prompts that tell you when to take action, and reports progress and the percent of completion.

When all the selected file have been restored, Norton Backup gives a summary report in the message area.

5 Click Done when the restore is complete.
You return to the Restore layer of the window.

6 Click the close box, or choose Quit from the File menu to leave Norton Backup.
To go to another utility, choose from the Utilities menu.

Restoring a Crashed Hard Disk

See Chapter 2, "Disk Repair and File Recovery" before trying the procedures in this section.

If your hard disk crashes as a result of a hardware failure, you will need to prepare it before you can restore the files from your most current backup set.

1 **Format the crashed hard disk using the formatting program that came with your hard disk.**
(Make sure that you give the hard disk the same name as it originally had.)

At this point you may want to start your Macintosh using the Norton Utilities Emergency floppy disk, and then run Norton Disk Doctor to ensure that your hard disk doesn't have any serious problems. And, after you've restored your files, run Norton Disk Doctor again.

2 **Install the System from your original System software floppy disks.**

3 **Rename the System Folder to "Temp."**

4 **Insert the Norton Utilities floppy disk that has the Norton Backup on it. Drag the Norton Backup icon to the "Temp" folder and then eject the floppy disk.**

5 **Start Norton Backup by double-clicking its icon.**

6 **Switch to the Restore layer by clicking the dog ear in the Options area.**

7 **Choose the media type and then click the Read Catalog button.**
Norton Backup will display a dialog box that asks you to insert the last floppy disk in the backup set.

8 **Insert the last floppy disk in your backup set.**
Norton Backup will read the catalog and display its file list in the Selection area.

9 Select any restore and general options in the Customize Settings dialog box.
You can use the Restore and Verify option to ensure that the backed up information was restored to your hard drive without errors. For more information, see "Step 3: Selecting General and Restore Options" in the Restore section.

10 Select the entire volume for restore by clicking in the checkmark column next to the volume's icon.

11 Click the Start Restore button.
The Message area displays prompts to alert you to insert floppy disks, as well as graphically displaying the restore progress. When your files have been restored, a restore status dialog box appears.

12 Click Done when the restore is complete.

13 Quit Norton Backup by choosing Quit from the File menu.

14 Restart your Macintosh using the System Tools floppy disk.

Use the Disk Tools floppy disk.

15 Throw away the "Temp" System Folder and "bless" the System Folder that you restored by opening it and closing it again.

16 Restart your Macintosh.

Rebuilding a Catalog

Each backup description file that you create has a catalog that is automatically created at the end of your first backup. This catalog is the key to your whole backup set; it keeps track of which folders and files are stored on your backup set, their location within the backup set, and their modification dates. The catalog is required in order for you to restore your files. As a precaution, Norton Backup stores two copies of the catalog. One copy is kept on your hard disk (in the backup description file), and the other is kept on the last floppy disk in the backup set.

There are two situations in which you would need to rebuild a catalog.

- When both the hard disk and the floppy disk versions of the catalog are missing.
- When one or several floppy disks from the backup set are missing.

Missing Catalog

To rebuild a missing catalog, you will need to choose the Restore Untitled item in the Backup pop-up menu, the media type, and then click the Read Catalog button. Norton Backup will send a dialog box that asks you to insert the last floppy disk in the backup set. (Norton Backup stores the catalog on the last floppy disk of the backup set.) At this point, you can either cancel the procedure or click the Can't Find button.

Clicking the Can't Find button alerts Norton Backup to the fact that you are missing the catalog. Click the Rebuild Catalog button to initiate the Rebuild process. Norton Backup will ask for the floppy disks in consecutive order. Follow the prompts until all floppy disks have been inserted and the catalog is rebuilt.

Missing Floppy Disks

When one or more floppy disks are missing or have been damaged, you will need to rebuild the catalog. Because the catalog may still be on the hard disk you will need to choose

the Restore Untitled item, the media type, and then click the Read Catalog button. Norton Backup will send a dialog box that asks you to insert the last floppy disk in the backup set. At this point, you should click the Can't Find button to alert Norton Backup to the fact that you want to rebuild the catalog. The Missing Backup Set Catalog dialog box appears on the desktop. Once you click the Rebuild Catalog button, Norton Backup will ask for the floppy disks in consecutive order. Follow the prompts until all floppy disks have been inserted and the catalog is rebuilt.

After the rebuild process has started, you can insert the last floppy disk so that Norton Backup can read the information from it. It won't use the catalog that is on the floppy disk because the rebuild process has already begun.

Menu Commands

These menu commands are available from both the Backup and Restore layers.

File Menu

- **New (Command+N)**
  Allows you to create a new backup description file.
- **Open... (Command+O)**
  Brings up an Open dialog box in which you can open existing backup description files.
- **Close (Command+W)**
  Quits Norton Backup.
- **Save (Command+S)**
  Saves changes to the backup description file currently chosen in the Backup File pop-up menu.
- **Save As...**
  Brings up the Save As dialog box, which allows you to save and name (or rename) the current backup description file.

- **Save Preferences**
  Allows you to save changes to the Preferences file. The changes will be effective for the Untitled item.
- **Backup**
  Switches to the Backup layer.
- **Restore**
  Switches to the Restore layer.
- **Quit (Command+Q)**
  Quits Norton Backup.

Edit Menu

This menu contains the typical Undo, Cut, Copy, and Paste commands that are found in most Macintosh applications. They are not available for use in the Norton Backup. For this reason, they are dimmed in Norton Backup.

View Menu

- **Folders and Files**
  Displays the folders and files as an indented tree. This is the default display.
- **Flat Files**
  Displays the file list by volume with all of its files (no folders) listed underneath.
- **by Name**
  Displays volumes, folders, and files sorted by name.
- **by Date**
  Displays volumes sorted by name, and folders and files by modification date. The list is arranged in preceding order with the most recent modification date first.
- **by Size**
  Displays folders sorted by name, and files sorted by size. The list is arranged in descending order with the largest size first.

Selections Menu

- **Go Inside (Command+Down)**
  Expands the first folder under or after the highlight. The first entry within the folder is highlighted.
- **Go Outside (Command+Up)**
  Collapses the folder containing the highlight.
- **Skip Forward (Command+Tab)**
  Moves the highlight through folders and files in the same level.
- **Collapse (Command+K)**
  Collapses the currently highlighted volume or folder.
- **Collapse All (Command+[)**
  Collapses the entire file list.
- **Expand (Command+E)**
  Expands the highlighted volume or folder one level if possible.
- **Expand All (Command+])**
  Completely expands the highlighted volume or folder to display only folders or only files, or both folders and files.
- **Expand Folders (Command+F)**
  Expands the currently highlighted volume or folder to display only folders.

Preferences File

The Preferences file contains the default settings for the type of backup, media type, options, and special file selections. In addition, it also tracks all of your backup description files and all the scheduled events.

The Untitled items in the Backup pop-up menu use the default settings. You can modify the default settings by changing an existing backup description file or the Untitled item, and then choosing the Save Preferences command in the File menu. Every backup description file that you create from the Untitled item will have the new defaults.

Norton Backup is shipped with the following preference settings:

- **Backup**
  "New Backup -Untitled-"
- **Media Type**
  1.44MB Floppy Disk (if one is installed, otherwise, 800 K Floppy Disk).
- **Backup Options**
  Compress (On), Verify During Backup (On), and Ask Before Overwriting (Off).
- **Restore Options**
  Restore Only, Ask Before Replacing Files (On), and Restore to Original Locations (On).
- **General Options**
  Use Sound (Off) and Pause in Background (Off).
- **Special File Selections**
  All checkboxes are off.

When backing up files so that they can be deleted from your hard drive (archived), it is a good idea to use the Verify Only option available in the Restore layer to ensure the validity of the backup set. See "Step 3: Selecting Restore and General Options" in the Restore section.

REFERENCE

Norton Disk Doctor

Contents

R-121 Norton Disk Doctor
R-121 When to Use
R-121 How to Use
R-125 Using the More Dialog Box
R-128 Tips and Suggestions

Norton Disk Doctor

The Norton Disk Doctor automatically diagnoses and attempts to repair damaged disks. You can fix both hard disks and HFS floppy disks.

When to Use

Use the Norton Disk Doctor when your Macintosh cannot start from your startup disk or open a non-startup disk. See Chapter 1, "Diagnosing Problems," for a detailed list of symptoms.

You should also use Norton Disk Doctor on a regular basis—such as weekly or monthly—to prevent small problems from turning into big problems.

How to Use

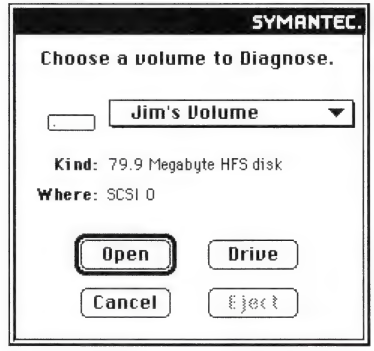
For step-by-step instructions on using Norton Disk Doctor, turn to Chapter 2, "Disk Repair and File Recovery."

If your startup disk is damaged, use the Emergency Disk provided (or preferably a backup copy) to start up your Macintosh. In the Finder, start the Norton Utilities for Macintosh by double-clicking its icon. The Norton Utilities Main Menu appears. Click the Norton Disk Doctor button, located at the top of the window.

First you're asked to specify which disk to repair. The Choose Volume dialog box appears.

Figure NDD-1

The Norton Disk Doctor Choose Volume dialog box

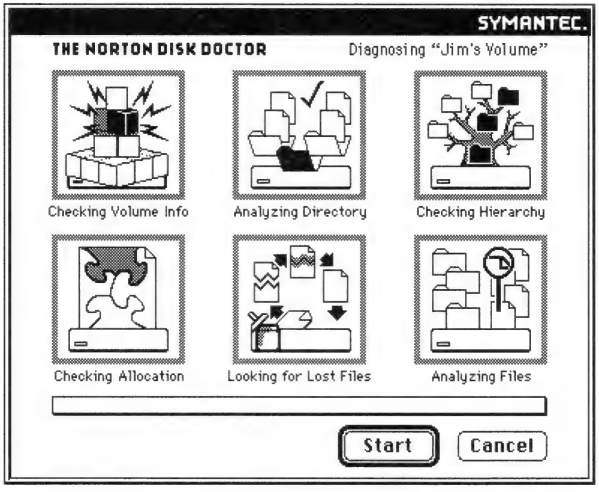


If you wish to diagnose a floppy disk, insert it into a free disk drive. The disk name will appear on the pop-up menu. If you want to select another disk, you can either choose it from the pop-up menu or click on the drive icon. If you do not see the disk listed in the pop-up menu, see "Using the More Dialog Box" later in this section.

After the disk is selected, click the Open button to enter Norton Disk Doctor. Click Cancel to exit the Norton Disk Doctor entirely. The Norton Disk Doctor main screen appears.

Figure NDD-2

The Norton Disk Doctor main window



Click Start to begin diagnosing.

The Norton Disk Doctor checks six general areas where problems may occur:

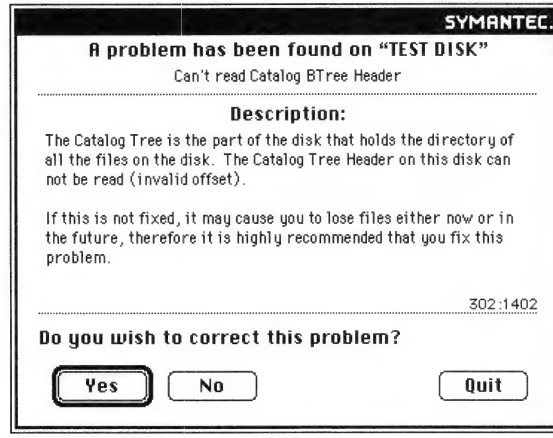
- **Checking Volume Info**
  Checks to see if the disk can be mounted (displayed on the desktop).
- **Analyzing Directory**
  Makes sure all files are present and accounted for. Fixes folders that won't open, files that can't be removed, and so on.
- **Checking Hierarchy**
  Makes sure all directory information is correct.

- **Checking Allocation**
  Finds areas on disk that have been assigned to more than one file. Such files are said to be "cross-linked."
- **Looking for Lost Files**
  Searches the disk for areas that are reported as "in use" but not assigned to any known file. These areas are sometimes called "lost sectors."
- **Analyzing Files**
  Checks every file on the disk for problems such as missing Finder icons and damaged or corrupted files. Also finds duplicate copies of the system and the Finder.

If the Norton Disk Doctor finds a problem at any point, it will stop and report the problem to you in a dialog box.

Figure NDD-3

The Problem dialog box


SYMANTEC.
A problem has been found on "TEST DISK"
Can't read Catalog BTree Header
Description:
The Catalog Tree is the part of the disk that holds the directory of all the files on the disk. The Catalog Tree Header on this disk can not be read (invalid offset).
If this is not fixed, it may cause you to lose files either now or in the future, therefore it is highly recommended that you fix this problem.
302:1402
Do you wish to correct this problem?
Yes
No
Quit

If the problem can be fixed, a dialog box similar to that shown in Figure NDD-3 will appear. You will see a brief description of the problem and why you should correct it. The only reason you would not choose to correct a problem is if you are only performing diagnosis at this point and intend to fix the problem before you try to use your Macintosh.

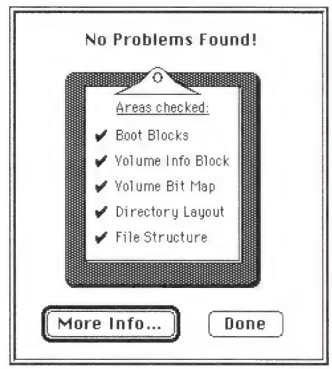
Click Yes to fix the problem and proceed with the diagnosis. Click No to proceed without fixing the problem. Click Quit to leave the Norton Disk Doctor without fixing the problem.

If the problem cannot be fixed, you will see a brief description of the problem and a suggestion on what to do next.

When you're done, a dialog box is displayed.

Figure NDD-4

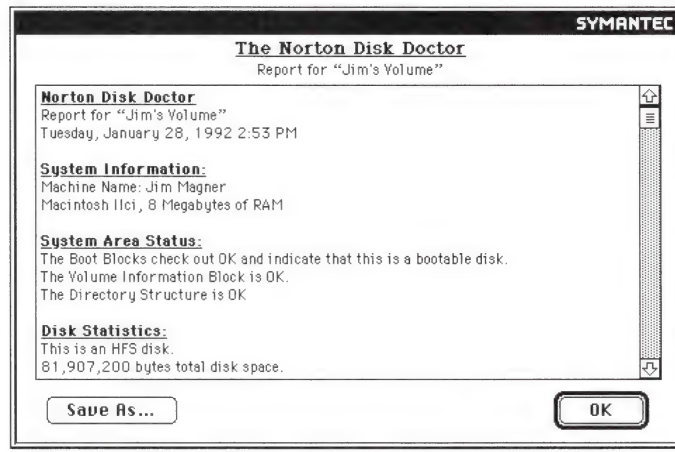
The Checklist dialog box



Click Done to quit the Norton Disk Doctor. You're returned to the Norton Utilities for Macintosh Main Menu. If, however, you want more information about your disk, click More Info. The More Info dialog box appears.

Figure NDD-5

The Report dialog box


SYMANTEC.
The Norton Disk Doctor
Report for "Jim's Volume"
Norton Disk Doctor
Report for "Jim's Volume"
Tuesday, January 28, 1992 2:53 PM
System Information:
Machine Name: Jim Magner
Macintosh IIci, 8 Megabytes of RAM
System Area Status:
The Boot Blocks check out OK and indicate that this is a bootable disk.
The Volume Information Block is OK.
The Directory Structure is OK
Disk Statistics:
This is an HFS disk.
81,907,200 bytes total disk space.
Save As...
OK

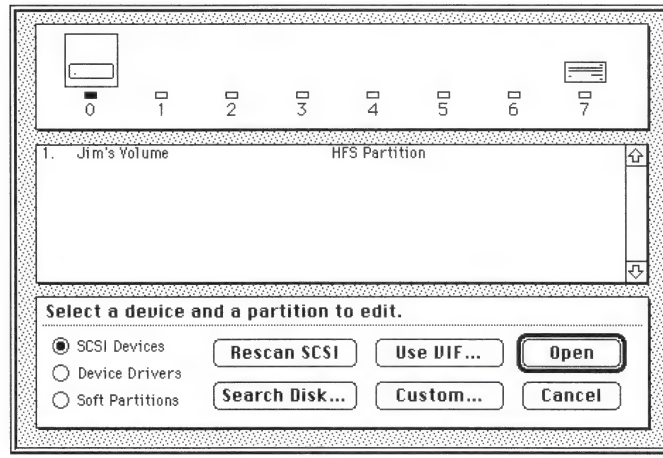
Click Save As to save this report as a text file. You can open this file and print it with a word processor or the Teach Text application. When you've finished, click OK. You're returned to the Norton Utilities for Macintosh Main Menu.

Using the More Dialog Box

There are times when a disk can't be located and thus will not appear in the Choose Volume dialog box. If you don't see the disk you want, choose the More command from the pop-up menu. Doing so brings up the More dialog box.

Figure NDD-6

The More dialog box



Norton Disk Doctor tries to locate a disk drive by looking for three kinds of information—it can attempt to locate SCSI devices by their ID numbers, it can look for device-driver software, or it can attempt to locate soft partition information. When you select one of the three options, the panel changes to reflect the type of information needed to locate the device. The three device selection methods are described next.

Whatever method you choose, when you've finished with the More dialog box you'll return to the Choose Volume dialog box described earlier. At that point, click Open to begin diagnosing.

SCSI Devices

You can scan for SCSI hard drives and partitions on them. (See Figure NDD-2.) In the upper section of the dialog box is an area showing the available SCSI devices on your system. ID numbers occupied by a device are indicated by a filled rectangle; open rectangles show unassigned ID numbers. If possible, a device icon appears above each occupied ID slot. When you click a device icon to select it, the volume partitions on that device (if any) appear in the center of the dialog box. Click a partition's name to select it for repair.

On the bottom-right of the dialog box are six buttons:

- **Rescan SCSI**
  Forces the Norton Disk Doctor to look at all available SCSI drives again. It may be that a device had not warmed up and "reported in" by the time you first ran the Norton Disk Doctor, so this option may succeed in locating a missing device. The other buttons are dimmed unless you select a SCSI device first.

- **Search Disk**
  Will search an entire SCSI device looking for HFS volumes, providing access to volume partitions that otherwise might be unavailable. The Norton Disk Doctor will automatically attempt to determine a disk's size for you. Before you begin the disk scan, be sure to confirm the size. If the size is incorrect or not listed, you can enter it in either megabytes or in total number of sectors.

- **Use VIF**
  Lets you locate a drive or partition by finding and using the Volume Information File (VIF). To use this option, you must have an existing VIF for the drive. (VIFs can be created at installation, by using the appropriate option in the Norton Utilities Main Menu, or by using Symantec Utilities for the Macintosh. When you click the Use VIF button, you are presented with an "Open File" dialog box; locate the appropriate VIF and click Open.

- **Custom**
  Lets you enter specific data regarding the disk volume you want to recover. This information includes the starting block for the volume, the physical sector size, the

number of blocks in the volume, the allocation block size, and the first block in the volume bitmap (see the *Norton Disk Companion* section of this manual for more information on these and other technical concepts). You can have the Norton Disk Doctor attempt to determine appropriate values by clicking Guess. If you enter values yourself, click Validate to have the Norton Disk Doctor check to see if such a volume exists. Click OK to accept all values and Cancel to exit without taking action.

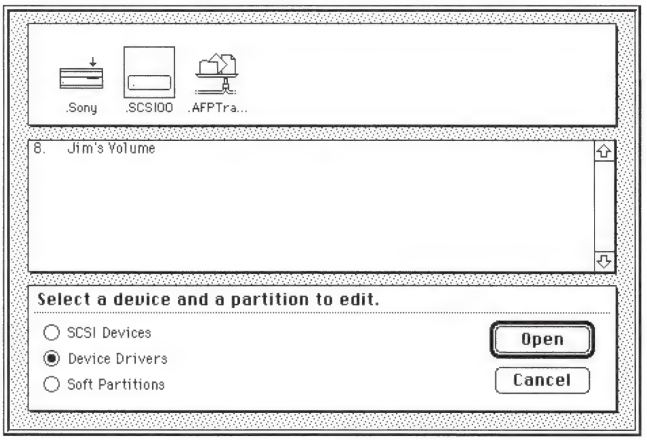
However you end up selecting a volume, click Open on the More dialog box to attempt to open the selected volume. Click Cancel to leave the More dialog box without taking action.

Device Drivers

You can also search for volumes by looking for their *device drivers*. A device driver is software used to run the physical hardware upon which the volume resides. Click the center option button at the bottom-left of the More dialog box to use this option.

Figure NDD-7

The Device Drivers option in the More dialog box



Available devices are shown in the area at the top of the dialog box. Click a device icon to select it; volumes on that device appear in the center of the dialog box. Click Open to choose a volume for diagnosing, or click Cancel to leave the More dialog

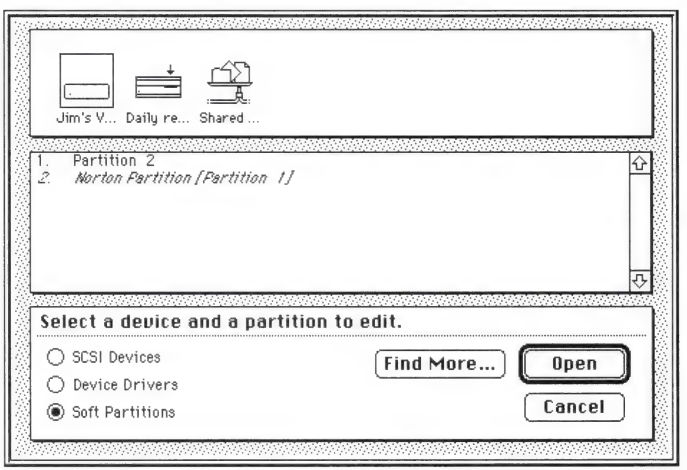
box without taking action. Note that if you don't click Open, the device you selected won't be passed to the Choose Volume dialog box.

Soft Partitions

Finally, you can also scan available devices for soft partitions. Click the bottom-left option button on the More dialog box to select this option.

Figure NDD-8

The Partitions option of the More dialog box



Available devices are shown in the area at the top of the dialog box. Click a device icon to select it; volumes on that device appear in the center of the dialog box. You can click Find More to have the Norton Disk Doctor attempt a more comprehensive scan of the volume. Click Open to choose a volume for diagnosing, or click Cancel to leave the More dialog box without taking action.

Tips and Suggestions

If you have a large number of files on a single disk (roughly over 5,000), or a number of large files, the Norton Disk Doctor may require more memory than the preset assignment. To adjust the amount of memory that Multifinder gives to the Norton Disk Doctor, select the Norton Utilities icon in the Finder, then

choose Get Info from the File menu. At the bottom of the window is a small text entry box where you can increase the amount of memory assigned.

Although the Norton Disk Doctor is compatible with Multifinder, there are times when System 6 users may want to run it under the single Finder. Doing so gives you more memory without having to make adjustments. Use the Set Startup command to start your Macintosh from the single Finder instead of MultiFinder, or start up using the Emergency Disk. You should use the single Finder if the drive you're diagnosing is the startup drive, or has open files on it.

It's possible for one disk problem to mask another. That's why you should always run the Norton Disk Doctor a second time if it has found and corrected problems on the first pass. If after several passes the Norton Disk Doctor still finds problems, your disk may be seriously flawed. Back up all the files you can from it (you can use the Norton Backup utility to do this). Next, run Volume Recover to recover any files that you weren't able to back up. Finally, reinitialize the problem disk and restore your backup files to it.

REFERENCE

Norton Disk Editor

Contents

R-133 Norton Disk Editor
R-133 When to Use
R-133 How to Use
R-134 Exploring Disks
R-135 Edit File
R-136 Edit Info
R-139 Norton Disk Editor Menus
R-139 File Menu
R-139 Edit Menu
R-141 Objects Menu
R-143 Display Menu
R-144 Information Menu
R-144 Utilities Menu

Norton Disk Editor

For the expert, the actual contents of a disk are sometimes vital to successfully repairing a file or retrieving data when all other methods have failed. Besides, looking around a disk can be fun.

When to Use

The Norton Disk Editor displays and allows you to modify the bits and bytes on a disk. The information is displayed in the same logical structure your disk has, including the essential bookkeeping information that you're never otherwise aware of. You can also examine the contents of all the files on your disk; this information may be displayed and edited in either hexadecimal or ASCII notation.

With the Norton Disk Editor, you can learn how a Macintosh disk is organized. Such knowledge could be very handy later on. You can also search the disk for particular phrases or sentences. In this way, you can locate documents by their contents rather than their names. You can also view the contents of documents without opening them; this can save time when you're just browsing. Those with sufficient technical expertise can attempt repairs to damaged documents. It is sometimes the only way to repair heavily damaged files. See the *Norton Disk Companion* section of this manual for further information about your disks.

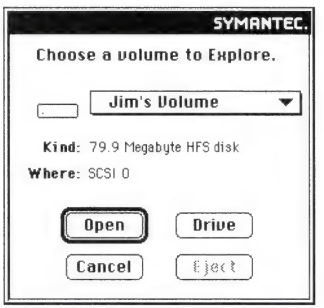
Changing the information on a disk is very tricky business. It's quite easy to change a document in such a way that its application refuses to open it. It's also possible to lose documents by mistakenly changing their bookkeeping information. Thus, we must recommend that you not save any changes to your disk unless you're absolutely certain about what you're doing. If you're surprised by a dialog box asking you to confirm whether you want to write sectors to the disk, just say no. However, it doesn't hurt at all to just look.

How to Use

Start the Norton Disk Editor from the Utilities menu of the Norton Utilities for Macintosh. The Choose Volume dialog box appears, and you are asked which disk volume you wish to explore.

Figure NDE-1

The Norton Disk Editor Choose Volume dialog box



Choose the drive you want to explore from the pop-up menu. If you don't see the drive, choose Scan SCSI Bus. If the drive you want still doesn't appear, choose the More command to attempt to locate it.

When you choose More, the More dialog box appears. Using this dialog box you can have the Norton Disk Editor scan for three kinds of information: it can attempt to locate SCSI devices by their ID numbers; it can look for device driver software, and it can attempt to locate soft partition information.

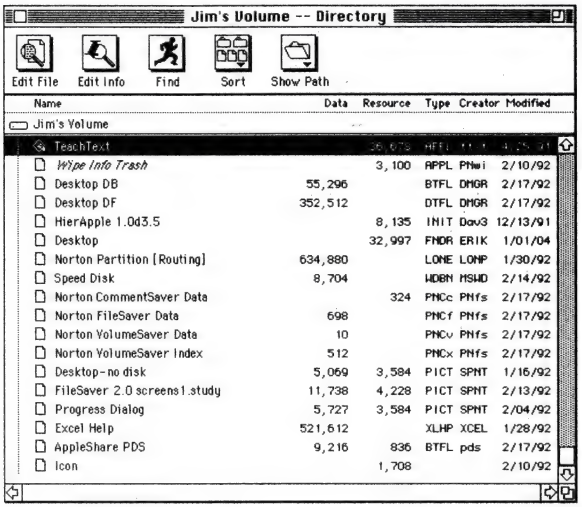
For a complete discussion of the More dialog box functions, see the preceding Norton Disk Doctor reference section.

Exploring Disks

The Norton Disk Editor reads information from your disk and then displays a window.

Figure NDE-5

The Norton Disk Editor main window


Jim's Volume -- Directory
Edit File
Edit Info
Find
Sort
Show Path
Name
Data
Resource
Type
Creator
Modified
Jim's Volume
TeachText
Wipe Info Trash 3,100 APPL PNwi 2/10/92
Desktop DB 55,296 BTFL DMGR 2/17/92
Desktop DF 352,512 DTFL DMGR 2/17/92
HierApple 1.0d3.5 8,135 INIT Dav3 12/13/91
Desktop 32,997 FNDR ERIK 1/01/04
Norton Partition [Routing] 634,880 LONE LONP 1/30/92
Speed Disk 8,704 WDBN MSWD 2/14/92
Norton CommentSaver Data 324 PNCc PNfs 2/17/92
Norton FileSaver Data 698 PNCf PNfs 2/17/92
Norton VolumeSaver Data 10 PNCv PNfs 2/17/92
Norton VolumeSaver Index 512 PNCx PNfs 2/17/92
Desktop-no disk 5,069 3,584 PICT SPNT 1/16/92
FileSaver 2.0 screens1.study 11,738 4,228 PICT SPNT 2/13/92
Progress Dialog 5,727 3,584 PICT SPNT 2/04/92
Excel Help 521,612 XLHP XCEL 1/28/92
AppleShare PDS 9,216 836 BTFL pds 2/17/92
Icon 1,708 2/10/92

The scrolling list at the bottom of the window shows the contents of your disk: files, folders, and their relationships. Click an item to select it; double-click a folder icon to toggle the folder open and closed.

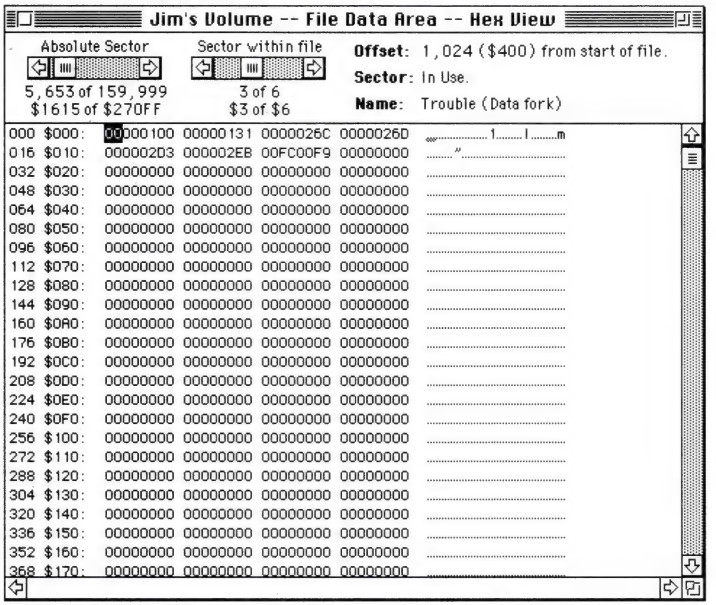
There are five buttons at the top of the window.

Edit File

Opens an additional window with a hexadecimal representation of the file's contents. You are shown one sector (512 bytes) of the file at a time. The file's absolute location on the disk is shown, as is your current offset (distance from its beginning) within the file. The current position of the cursor is highlighted. If you type any changes, you will be asked whether to save them when you attempt to close the window or to change to another sector. Be certain that you want to make these changes before saving them.

Figure NDE-6

The Edit File window



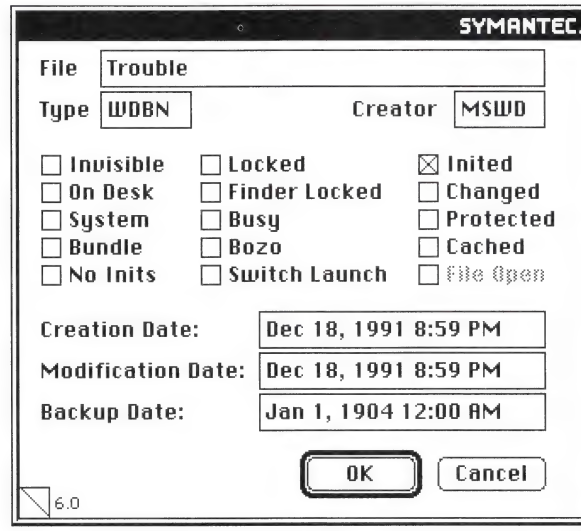
Use the two scroll bars at the top left of the window to move among sectors on your disk or individual sectors within the current file. Use the scroll bar at the right to move up and down in the view of the current sector. The left two columns show the offset (distance from the) first byte in the sector to the first byte in the line (in decimal and hexadecimal notation). The next four columns have hexadecimal representations of the bytes themselves. The last column is an ASCII representation of the data.

Edit Info

Each document, application, and folder on a disk has certain attributes. These include the date and time it was created, the date and time it was last modified, whether it has an icon bundled with it, whether it is visible on the desktop, and so on. This button brings up a dialog box in which you can examine and change these attributes.

Figure NDE-7

The Edit Info dialog box



A dog-ear lets you switch pages for System 6 and System 7 attributes.

The following table explains these attributes.

Attribute	Meaning
Invisible	File or folder is not visible within the Finder. The Desktop file is an example.
On Desk	File or folder is shown directly on the desktop and not in its appropriate window.
System (System 6)	A special file used by the system; the file's name cannot be changed.
NameLock (System 7)	Same as above.
Bundle	File has an icon bundle.
No Inits	For INITs and CDEVs, this bit is set if the file has no INIT resources within it; if the file is an application, it is to be opened read-only for network use.
Locked File (System 6)	Can be opened but not modified or deleted.

Attribute	Meaning
Is Alias (System 7)	File is an alias to another file.
Finder Locked	File cannot be changed or deleted. (The Locked checkbox in Get Info sets this bit.)
Custom Icon (System 7)	File has its own, custom icon resource.
Bozo (System 6)	Early form of copy protection, no longer used.
Is Stationery (System 7)	File is a stationery pad; opening application copies file, then opens the copy.
Switch Launch	System on the disk from which this application is launched becomes active system.
Inited	Finder has "seen" the file.
Changed	File has been modified.
Busy (System 6)	File is in use.
Protected	File cannot be copied, duplicated, or moved.
Cached File (System 6)	To be stored in the RAM cache, if any.
Shared (System 7)	Application available to multiple users on network.
File Open	File is in use.

- **Find**
  Lets you search the disk for a specific information. You can search for ASCII or hexadecimal data, or for straight text. You can search for files by name, file type and creator, by attributes, by file number, and even by directory ID number. See the description of Find in the Edit menu section below for more information on using the options in this dialog box.

- **Sort**
  Allows you to change the order in which documents, applications, and folders are shown in the directory window.

- **Show Path**
  Indicates how to get to the currently selected file. Shows the folder the file is in, the folder *that* folder is in (if any), and so on, all the way up to the disk itself.

Norton Disk Editor Menus

Most of the Norton Disk Editor features are accessed from the menus.

File Menu

- **Open File**
  Opens the Edit window in hexadecimal view for a file you choose to view from the standard Open dialog box.
- **Open Volume**
  Brings up the Explore Volume dialog box, allowing you to specify another volume to explore, in addition to the one you specified when first starting the Norton Disk Editor.
- **Close**
  Closes the current window.
- **Page Setup**
  Brings up the standard Apple Page Setup dialog box.
- **Print**
  Prints the contents of the current window to the printer selected with the Chooser.
- **Quit**
  Quits the Norton Disk Editor and returns you to the Finder.

Edit Menu

- **Copy**
  (Only available in the hexadecimal editor.) Copies byte selection.
- **Paste**
  Pastes contents of clipboard to the current insertion point in the hexadecimal editor.
- **Find**
  Brings up the Find dialog box. You may search the disk for a variety of things.

Figure NDE-8
The Find dialog box

At the upper left of the dialog box is a pop-up menu. Here you select what type of information you wish to search by. The choice you make determines what information you need to enter in the dialog box. The Find dialog box changes to reflect the choice you make.

ASCII/Hex Searches the disk for a given string of ASCII or hexadecimal data.

File Name Searches for a file by name. Enter the name in the text box.

Type/Creator Searches for files that match type and creator codes that you enter. You can type these in or choose from among those listed in the pop-up menus.

Attribute Presents a list of attributes. Attributes whose checkboxes you select are used as search criteria. Finds all files with the given attributes set.

File Number Finds the file (if any) matching the ID number you enter.

Directory ID Finds the file (if any) matching the directory ID number you enter. Click Find to initiate the search or Cancel to leave the dialog box without taking action.

Find Again Begins a new search for the information entered previously in the Find dialog box.

Objects Menu

The Objects menu lets you view the important record-keeping data structures on your disk. You can also specify an absolute sector to view. Finally, this menu lets you write new information to a sector.

The first seven commands control what you see. If the active window is a directory window, a new window opens displaying the selected information. If the active window is not a directory window, the window changes to show the new information. Hold down the Shift key when selecting one of these commands to always open a new window.

- **Boot Blocks**
  Opens a window to a view of the first sector on your disk. This sector contains information that is read at startup time.

- **Volume Info Block**
  Sector that contains additional information about the disk volume you're currently exploring. (The next several sectors after the Volume Info Block are the Volume Bit Map; these sectors show which data sectors are occupied (sixteen consecutive occupied sectors get the hexadecimal representation "F") and which are free (sixteen consecutive free sectors show up as "0"). Free sectors are not yet assigned to any file, although they may contain data left over from previously erased files. Indeed, it is unassigned sectors alone that constitute the area from which old files may be recovered using UnErase.)

- **Extents Tree Header**
  Shows the bookkeeping information about the disk's Extents Tree. The Extents Tree is a data structure that keeps track of file fragments. Not all files can be stored in one set of contiguous sectors, particularly files that have been extensively modified and are also quite large, such as databases and spreadsheets. The Extents Tree keeps track of the location of each piece of all fragmented files, including which fragment belongs to whom, where it begins on the disk, and how long it is.

- **Extents B-Tree**
  Shows the contents of the Extents Tree itself, one node at a time. You can move up, down, left, and right among nodes in the tree using the appropriate buttons. (See the *Norton Disk Companion* section for more on the Extents B-Tree.)

- **Catalog Tree Header**
  The Catalog Tree keeps track of file and folder names and locations. This information is used by the Finder to locate files; the Desktop file you normally see is mainly a user convenience. The actual organization of a disk is kept in the Catalog Tree.

- **Catalog B-Tree**
  Shows the Catalog Tree. You can move up, down, left, and right among nodes in the tree using the appropriate buttons. (See the *Norton Disk Companion* section for more information on how the Catalog B-Tree is organized.)

- **Directory**
  A view of the organization of your disk, showing files, folders, and their relationships. This is the mode the window is in when you start the Norton Disk Editor (unless the disk is unmountable).

The next three commands in the Objects menu let you view specific sectors.

- **Read Previous Sector**
  Shows the absolute sector that is before the current sector. If this causes you to move to a different object, the window view changes accordingly (if AutoView in the Display/View As menu is selected).

- **Read Next Sector**
  Shows the absolute sector after the current sector. If this causes you to move to a different object, the window view changes accordingly (if AutoView is selected).

- **Read Sector**
  Brings up a dialog box in which you can specify a particular absolute sector to view. The sector's contents are then shown in a window, as described above.

The last command in the Objects menu is used to write changes to disk. Be especially careful when using this command.

- **Write Sector**
  Saves changes you have made to the current sector, writing them to disk. Be especially careful while using this command.

Display Menu

This menu contains commands to control how information is shown in both the Directory and Edit windows of the Norton Disk Editor.

- **Resource Fork**
  When examining a file in hexadecimal view (by clicking the Edit File button), choosing this command shows the contents of the file's resource fork, if it has one. The resource fork contains system-related information such as fonts, dialog boxes, and text strings. Not all documents have resource forks; all applications do.

  Note that the Norton Disk Editor does not distinguish among resource types. It presents the entire resource fork as a stream of bytes, without regard to the individual resources present. You can view and edit the resource map or the resource header in this way; this lets you repair damaged files. Use ResEdit or a comparable tool to edit individual resources.

- **Data Fork**
  When examining a file in hexadecimal view (by clicking the Edit File button), choosing this command shows the contents of the file's data fork. The data fork contains text, formatting information, and the like. Most documents have data forks; not all applications do.

- **View in Hex**
  Shows the currently selected object in hexadecimal representation.

- **View in ASCII**
  Shows the currently selected object in ASCII (character) representation.

- **View As**
  Commands in this submenu let you change the way in which the currently selected object is displayed. This is

mainly useful if a disk's directory housekeeping information is scrambled and you wish to view a particular object in a different way. If the AutoView command in this menu is checked, then as you view new objects, the view changes to show the object in its native format. If AutoView is not selected, new objects are displayed in the currently selected format, no matter what they are. This feature is distinct from the Objects menu.

- **Current Folder**
  Shows a directory view of the contents of the currently selected folder. This is the default when the Norton Disk Editor is initially started.

- **All Files Flat**
  Shows a single-level directory view of every file and folder on the disk. This is useful for disk housekeeping. You can sort the list any way you like. For example, you can choose to show most-recently modified files first (regardless of the folder they're in), or the largest files first, and so on.

- **All Files Outline**
  Shows a Finder desktop-based representation of all files and folders on a disk. Relationships among folders are indicated by dashed lines.

Information Menu

- **File Information**
  Brings up a dialog box showing attribute information about the currently selected file. Same as pressing the Info button on the directory window.

- **Disk Information**
  Displays a dialog box showing where various objects are located on the disk.

Utilities Menu

Each command in this menu transfers you to another Norton Utility. The current utility's name (in this case the Norton Disk Editor) is dimmed and has a checkmark next to it.

REFERENCE

Norton Encrypt

Contents

R-147 Norton Encrypt
R-147 When to Use
R-147 How to Use
R-148 Encrypt Layer Features
R-149 Decrypt Layer Features

Norton Encrypt

With Norton Encrypt, you can "scramble" a document's data so that no one can view it without supplying a password, (one which you will keep as safe and secure as your ATM card's personal identification number). Without the password, an encrypted document is useless. When you want to work with the document, just double-click it as usual. After supplying the password, you can open the document and work with it as you normally would. You must encrypt it again when you've finished, however.

When to Use

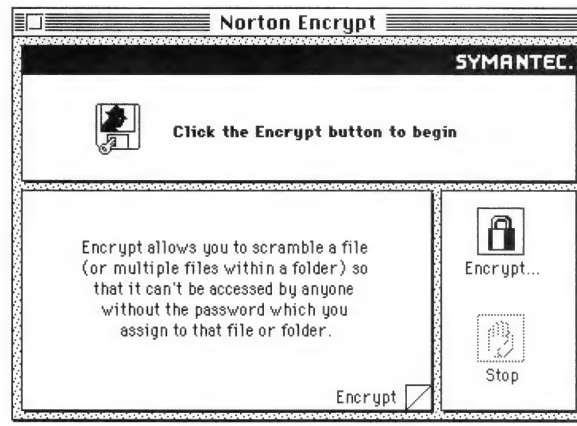
Use Norton Encrypt when you want to protect sensitive folders and documents from prying eyes. You can protect entire folders or single documents. You must supply an encryption password for each document or folder. And remember: if you forget or lose the password, documents encrypted with that password will be *permanently* scrambled. Use this feature carefully and don't forget your password!

How to Use

Double-click the Norton Encrypt icon in the Norton Utilities 2.0 folder to start it. The Norton Encrypt window appears, preset to the Encrypt layer.

Figure EN-1

The Norton Encrypt main window


Norton Encrypt
SYMANTEC.
Click the Encrypt button to begin
Encrypt allows you to scramble a file (or multiple files within a folder) so that it can't be accessed by anyone without the password which you assign to that file or folder.
Encrypt...
Stop
Encrypt

7 You can drag a document or folder icon directly to the Norton Encrypt icon to start the utility and set it to encrypt the document or folder contents.

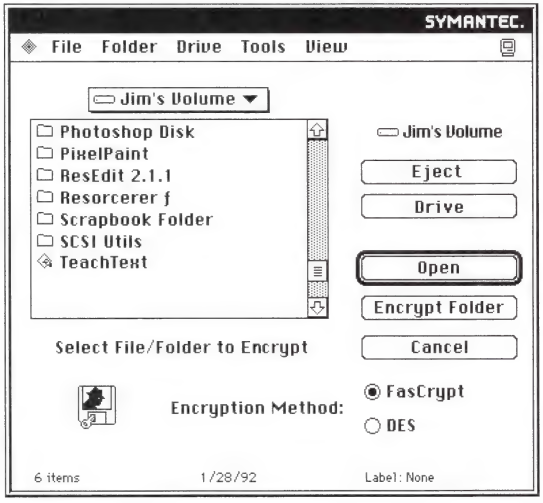
Encrypt Layer Features

A message area at the top of the window displays instructions. The lower-left area tells you about Encrypt; click the dog ear to toggle to the Decrypt layer. Click the Encrypt button to encrypt a document or folder or click Cancel to exit.

When you click the Encrypt button, another dialog box appears.

Figure EN-2

The Encrypt Choose File dialog box



Scroll through the list to find the document or folder you wish to encrypt. Click Open to open a folder, Encrypt File/Folder to encrypt the selected item, or Cancel to exit the dialog box without encrypting.

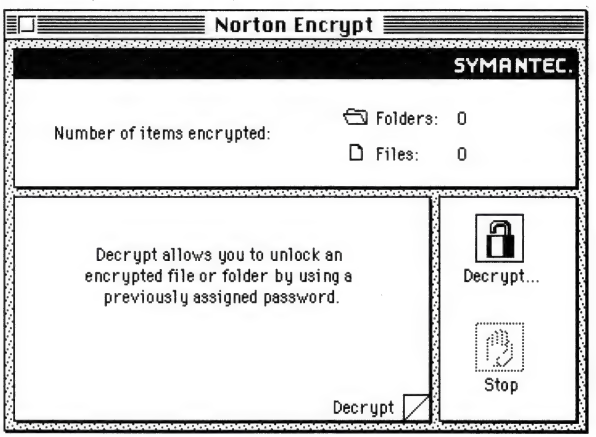
When you click the Encrypt File/Folder button on this dialog box, Norton Encrypt proceeds with encryption of the item you selected. You'll be asked to supply and confirm a password in a dialog box. Enter a password and click OK. You'll be informed of the encryption progress.

Decrypt Layer Features

A message area at the top of the window displays instructions. The lower-left area of the window tells you about Decrypt; click the dog ear to toggle to the Encrypt layer. Click the Decrypt button to decrypt a document or folder or click Cancel to exit.

Figure EN-3

The Norton Encrypt main window (Decrypt layer)

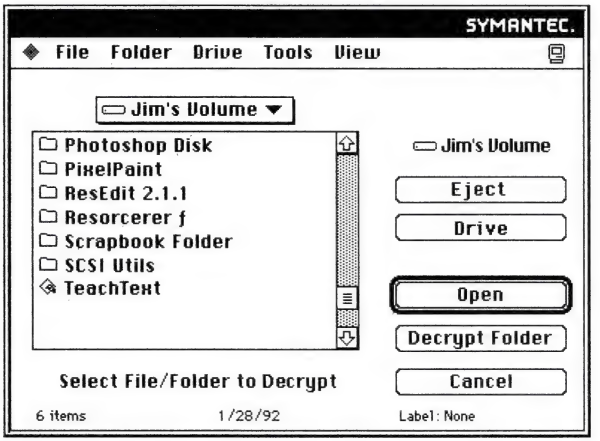


You can double-click an encrypted item's icon to decrypt it. Norton Encrypt will start in the Decrypt layer and you'll proceed immediately to the Password dialog box. Supply the encryption password and click OK to decrypt the file. After you quit Norton Encrypt, you must double-click the file's icon again to open it in its native application. You will have to encrypt it again after you close it.

When you click the Decrypt button, another dialog box appears that allows you to select the file you want to decrypt.

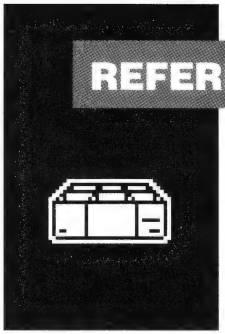
Figure EN-3

The Decrypt Choose File dialog box



Scroll through the list to find the document or folder you wish to decrypt. Click Open to open a folder, Decrypt File/Folder to decrypt the selected item, or Cancel to exit the dialog box without decrypting.

When you click the Decrypt File/Folder button in this dialog box, Norton Encrypt proceeds with decryption of the item you selected. You'll be asked to supply the correct password in a dialog box. Enter the password and click OK. You'll be informed of the decryption progress.



REFERENCE

Norton Partition

Contents

R-153 Norton Partition

R-153 When to Use

R-154 How to Use

R-155 Creating a New Partition

R-158 Modifying a Partition

R-158 Partition Menu

Norton Partition

Partition is a desk accessory that lets you create and manage disk partitions. A partition is an area on a disk that behaves as if it were a separate volume. Dividing a disk into partitions makes a large disk easier to manage and protects data by letting you keep your eggs in more than one basket, so to speak. Because each partition has separate bookkeeping information, there is less risk of losing an entire disk's data. The Partition desk accessory also provides security features that allow you to encrypt partitions—scrambling their data so that only you can read it—and protect them with passwords. This lets you protect your most sensitive data from prying eyes, while keeping your everyday files readily available.

When to Use

Why partition a disk? For one thing, partitioning is a handy way to manage a large hard disk (80 MB or more). One problem with larger disks is that they tend to become very cluttered. High capacity is good, but it can mean that you have so many documents and applications that it's difficult to locate the ones you want to work with. Partitioning provides an additional level of organization that lets you group like files, giving you all the benefits of a large disk without the clutter.

A partitioned disk can be safer than an unpartitioned one. An unpartitioned disk has only one set of bookkeeping files; lose these, and the entire disk may be lost. A partitioned disk has separate bookkeeping files for each partition. Even if one partition's critical data is destroyed, chances are the other partitions on the disk won't be affected.

You can also create partitions specifically to keep large amounts of data secure. The Partition desk accessory lets you encrypt, or scramble, partitions. Even a very clever spy can't decipher an encrypted partition's data without the proper information. And if you add password protection, only those who know the password—which you supply (and which you'd better remember)—can access the partition's data.

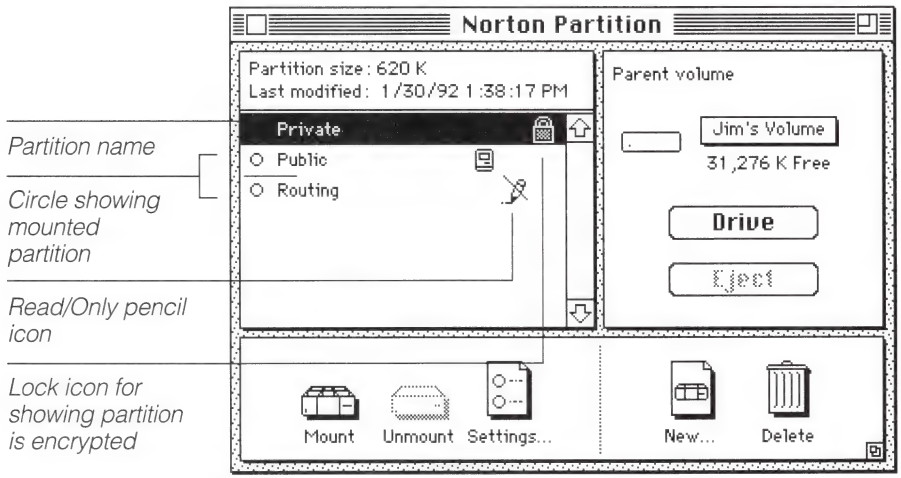
How to Use

To use Partition, select it from the Apple menu. The Partition main window appears.

> You don't have to have the Partition desk accessory in your Apple menu in System 7. If you haven't made it an Apple menu item, open it by double-clicking its icon in the Norton Utilities folder.

Figure PT-1

The Partition window



The Partition window is divided into three areas that organize its main controls.

Volume/Drive Selection

This is the upper-right section of the Partition window. Use the controls in this area to select the disk volume you want to partition, or whose partitions you wish to modify.

The Parent volume pop-up menu shows the currently selected volume. Drag the label to see volumes available and to choose among them. A small message below the menu shows how much space is available on the current volume.

Click the Drive button to change the current drive, and click the Eject button to eject a floppy disk. The Eject button is disabled if a floppy disk is not present.

Partition Selection

This is the upper-left area of the window where the partitions that you've created are listed. At the top is a message showing the size and date of the last modification of the currently selected partition (if any). Initially the message shows the name of the parent disk volume and the number of partitions on it.

The scroll box shows the partitions available on the currently selected volume. Click a partition's name to select it. Only one partition may be selected in this list at any one time.

If there are no partitions on the currently selected disk, the scroll box is empty and the scroll bar is disabled.

Function Selection

This is the section at the bottom of the Partition window. The buttons in this area let you create new partitions on the current volume and modify existing partitions.

The Mount button mounts the partition currently selected in the Partition Selection scroll box. When a partition is "mounted," it is available for use and appears on the desktop. The Unmount button unmounts the currently selected partition. An unmounted partition disappears from the desktop and is not available for use.

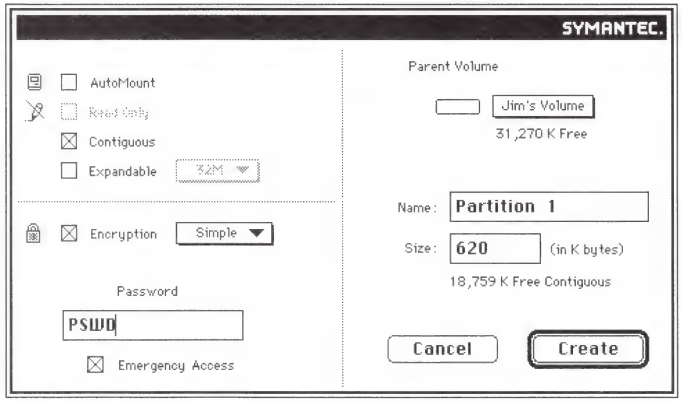
Click the New button to create a new partition for the currently selected volume. Finally, the Delete button deletes the currently selected partition. The Settings button allows you to modify the attributes of an existing partition. Finally, the Delete button deletes the currently selected partition.

Creating a New Partition

When you click the New button at the bottom of the Partition main window, the New Partition dialog box appears.

Figure PT-2

The New Partition dialog box



The New Partition dialog box is divided into three sections. In the upper-left area of the screen you specify the partition settings and attributes.

Norton Partition provides a variety of options that you can set using checkboxes. These options are only made available where they can be properly used. These are the options which can be set for a new partition:

- The **Contiguous** option allows a partition to occupy a single chunk of disk space with no intervening gaps. This option is only available when creating a new partition.
- The **Expandable** checkbox allows a partition to be expanded at some point after its creation. When checked, a partition size pop-up menu displays partition size options in megabytes.

The Contiguous and Expandable options are mutually exclusive. That is, only one of the two available options may be chosen for a partition.

In the lower-left area of the New Partition dialog box is the encryption section.

- The **Encryption** checkbox, if selected, causes the entire partition to be encrypted. The Encryption Type pop-up menu allows you to select the encryption algorithm. The available choices are Simple, Complex, FasCrypt, and DES. A password text edit box accepts an initial private password for the new partition configuration. The Password option is not available until the Encryption checkbox is selected.
- The **Emergency Access** checkbox allows "backdoor" access to the partition in case you happen to forget your password. It requires certain options from the Advanced Options dialog box. We have made sure this feature is available by default. You should always choose to check this option even if you are not using Norton Partitions on a network.

When you create an encrypted partition with a password, each time the partition is mounted or accessed through the Norton Partition desk accessory, a dialog box appears into which you must type the password you've chosen for the partition.

The third section of the New Partition dialog box, on the right side of the screen, contains partition and volume information. The Parent Volume pop-up menu displays a list of current volumes. You select a volume to partition from this list. You can name a partition by typing the name into the Name text edit box.

The Size text edit box allows you to specify the partition size in kilobytes. This box accepts numeric entries only, and is preset to 620K. The available space message below the Size box shows how much space in kilobytes is available on the selected volume. A partition cannot be larger than available disk space allows. Additionally, disk fragmentation can prevent Norton Partition from using all available space when creating a partition. It's best to first run Norton Disk Doctor and then Speed Disk on the volume you are planning to partition. This procedure is good preventive medicine as well as a way to increase the performance of your system.

When you are ready, click the Create button to create a new partition with the settings you've specified, or click Cancel to discard your settings and return to the Partition main window without creating a new partition.

Modifying a Partition

An existing mounted partition must first be unmounted before you can change its settings. Select the partition you wish to modify in the Partition main window scroll box and click the Settings button at the bottom of the screen.The Partition Settings dialog box appears. This dialog box is divided into the same three sections as the New Partition dialog box, and allows you to change the settings on the specified partition.

- The **Automount** checkbox can automatically mount the partition at startup. This option, as in the New Partition dialog box, is always available.
- The **Read Only** option can only be set and changed from the settings dialog. While this option is selected, you may not save or write data to this partition.

In the settings/attributes section of the Partition Settings dialog box (the upper-left area), the Contiguous and Expandable checkboxes are disabled because they can only be set when a partition is created. The Partition Size pop-up menu is also disabled if the partition was specified as expandable during creation.

In the partition/volume Information section (on the right side of the screen), you can enter a new size for the partition in the New Size text edit box; however, this option is available only if the Expandable checkbox was selected when the partition was created. A message below the New Size box displays the maximum size the current partition may be expanded to.

When you've finished modifying the partition settings, click the Save button to save the existing partition with the changes you made, or click Cancel to discard them.

Partition Menu

When Partition is active, the Partition menu appears on the menu bar at the top of the desktop. The commands available in this menu are described below. (Most of the menu commands actually duplicate functions available using the buttons in the Function Selection area of the Partition main window. A notable exception is the Advanced Options command.)

- **About Partition**
  Displays information about Partition.

- **Help**
  Opens Norton Partition help which appears within a dialog box. (This help is distinct from the on-line help available within the Norton Utilities.)

- **New**
  Opens the New Partition dialog box. Choosing this command is the same as clicking the New button at the bottom of the Partition main window.

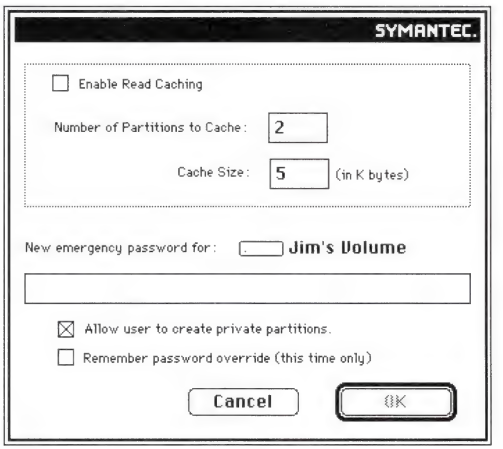
- **Delete**
  Deletes the currently selected partition from your hard disk. This command is disabled if no partition is selected or if the selected partition is mounted. Choosing Delete is the same as clicking the Delete button on the Partition window.

- **Settings**
  Opens the Partition Settings dialog box. This command is disabled when no partitions exist, when a partition is not selected, or when the selected partition is mounted.

- **Advanced Options**
  When a partition is selected, this command opens the Advanced Options dialog box via a password entry dialog box. The default password is "password" in lowercase.

Figure PA-3

The Advanced Options dialog box


SYMANTEC.
Enable Read Caching
Number of Partitions to Cache: 2
Cache Size: 5 (in K bytes)
New emergency password for: Jim's Volume
Allow user to create private partitions.
Remember password override (this time only)
Cancel
OK

The Enable Read Caching checkbox allows read caching to be performed on partitions. This means that frequently read data from partitions will be stored, or cached, in memory. This speeds up access.

Enter the number of partitions to cache in the "Number of Partitions to Cache" text box. Enter the amount of RAM to use for the cache in the Cache Size text box. The amount depends on how many partitions you want to cache and the size of the documents or complexity of the applications you're working with.

- **If you are not partitioning across a network, we strongly advise not changing the following Advanced Options default settings.**
  In other words, if your day-to-day use does not involve network activity, the following information can be disregarded, for Norton Partition is already optimized for a single user.

  The default network system administrator password in the "New emergency password" text box can be changed. This password does two things:

- Allows access to the Advanced Options dialog box.
- Allows access for all partitions on volumes that have the Emergency access checkbox option checked. This can be useful if a network user suddenly contracts "password amnesia."

  For additional information on using Norton Partition on a network, see Appendix D : Guide for the Network Administrator.

A user can create private partitions with separate password access if the "Allow user to create private partitions" checkbox is selected. This option is preset for you. If you are not on a network it is best to leave this option checked. The "Remember password override (this time only)" checkbox allows one-time emergency access to all password-protected partitions on the current volume. Emergency access requires entry of the system administrator password and access is permitted until the affected Macintosh is restarted.

Finally, clicking OK accepts the new settings and confirms password entry. Click Cancel to discard any changed settings and return to the Partition window.

- **Mount**
  Mounts the selected partition. The partition icon appears on the desktop and the partition can be used.
- **Unmount**
  Unmounts the selected partition.
- **Quit**
  Closes the Partition desk accessory.

REFERENCE

Speed Disk

Contents

R-165 Speed Disk
R-166 When to Use
R-166 How to Use
R-168 Additional Considerations
R-169 Easy Level Speed Disk
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Speed Disk

Even the healthiest of drives need periodic checkups. Hard work—even hard play—can slow down performance. Like the Finder desktop, which grows "fat" over time and slows the Finder down, your disk can become increasingly sluggish through constant use. Fortunately, just as you can rebuild the desktop, Speed Disk can rebuild your disk's contents to improve performance.

A volume optimizer, Speed Disk improves overall disk performance by eliminating file fragmentation (explained below), consolidating free space and placing it at the end of the disk, and marking off bad blocks.

When you use the Save and Save As commands, your Macintosh applications put sector-sized pieces (512 bytes) of the file you're writing from memory into free sectors on the destination disk. The *volume bitmap* is responsible for keeping track of which sectors are free or occupied on the disk. It's like a seating chart. A directory—consisting of the Catalog B-Tree and the Extents B-Tree file—keeps track of file locations. The Catalog B-Tree contains a unique entry for every file, specifying its name, attributes, location, and other information. It functions as an index or table of contents for the disk. The Extents B-Tree contains information about file fragments.

Files are written to physically contiguous sectors when possible, but as your disk fills up, files may become fragmented across the disk. For example, files can grow or shrink in size because of modifications made to them. Suppose you have a 5K file on your hard disk immediately followed by a 15K file. If you modify the first file so that it grows from 5K to 12K, the extra part of that file must be placed *after* the 15K file. In other words, the file becomes fragmented, and reading it from disk takes longer. Speed Disk consolidates all file fragments into contiguous areas on the disk, improving the speed with which files may be located and read into memory.

Speed Disk further prioritizes the placement of files on a disk so that infrequently modified files, such as system files, are moved toward the beginning of the disk. Since you rarely modify system files, it makes sense to place them toward the beginning of the disk, where you can expect them to remain together in

one contiguous chunk. Frequently modified files (such as the Desktop file, which is constantly updated) are best placed at the end of the disk, so they'll have room to grow and shrink without causing fragmentation to other files.

When to Use

Optimizing a disk not only increases software performance, it also decreases hardware wear and tear by reducing the amount of drive head movement.

In order to reduce fragmentation, you could copy all the data on your hard disk elsewhere (onto floppy disks, for example), erase and reinitialize your disk, and copy the information back. Speed Disk does a much safer—and smarter—job of optimizing your disk. It also provides visual feedback, showing all disk activity on a disk map during operation (an option that can be turned off to increase speed). Its two levels of operation, Easy and Expert, offer ease of operation for the less experienced user and extra flexibility for advanced users.

How to Use

You should take a few preliminary steps before you optimize your disk to ensure maximum efficiency and safety.

- Do some "disk housekeeping." Throw away files you haven't touched for eons and aren't likely to use again. Speed Disk can use the extra free disk space to operate more efficiently.
- Run Norton Disk Doctor on your disk, choose to repair any problems it might find.
- Make a backup of the disk to be optimized. Although Speed Disk is extremely safe, some other applications and startup documents might not be. You should back up your disk anytime you run an application that affects your entire disk. Consider cleaning up, backing up, and optimizing your disk as three aspects of the same periodic routine, to be performed at least once a month.
- Make sure you have the original distribution disks for any copy-protected software. Because copy-protected software often makes use of hidden files which may be

moved during Speed Disk's optimization, it may be necessary to reinstall certain applications. In fact, you may need to "deinstall" some of these copy-protected applications. Consult the application documentation for further information.

- Be prepared to start Speed Disk from a disk other than your startup disk, and make sure that there are no open (active) files on the disk you wish to optimize. Remember that you can always check to see how fragmented your startup drive is without actually optimizing by clicking the Check Drive. You can also erase free space on the startup drive, or on a drive on which files are currently open.

- When you're using MultiFinder, allow adequate memory for Speed Disk to do its job. Available memory greatly affects Speed Disk's performance. Since it is impossible to tell in advance exactly how large your drive is or how many files you have on the drive and how fragmented they are, Speed Disk is shipped with an Application Memory Size of 600K. This should be adequate for most drives, but be aware that an optimizer's task is more demanding on very large drives with a large number of files. Increasing Speed Disk's memory allocation in those situations will improve performance dramatically. You can change the Application Memory Size by selecting the Get Info command in the File menu of the Finder and entering a new value in the box provided. Better yet, restart from either the Emergency HD or Application Disk 1—depending on the system software you are running—and start Speed Disk from there.

- If you use Speed Disk's Expert level, be sure to choose the Check Media and Check Files commands in the Speed Disk Explore menu *before* you optimize, or make sure the Verify Media and Verify Files options are selected before optimization. These commands and options check the readability of the sectors on your hard disk and make sure that the file allocation information recorded in the directory corresponds to the actual files on your disk. If Speed Disk encounters a problem reading data from a particular block, it will mark that block as bad (in which case you shouldn't optimize, or you should be prepared for Speed Disk to stop when it

runs across bad blocks during optimization). If there are discrepancies between the volume bitmap and data on the disk, Speed Disk will correct the problem if possible. However, if the discrepancies are serious, you will be prompted to go to the Norton Disk Doctor for diagnosis and repair of the problem.

Additional Considerations

Although Speed Disk can automatically provide you with a diagnosis of your disk and recommend whether optimizing is needed (in Easy level), or provide you with the percentage of fragmentation (in Expert level), there are a few other considerations to keep in mind. First of all, be aware that Speed Disk computes its fragmentation percentage for a particular disk as the ratio of the total number of files with at least two fragments to the total number of files (whether fragmented or contiguous). This means that no special weight is given to files which may be severely fragmented. Therefore, you should ideally make your decision whether or not to optimize on the basis of this percentage *and* by considering which particular files are fragmented. If, for example, certain frequently used files—especially large database files—are fragmented, you should probably optimize your disk even if the total fragmentation percentage is low. Some files are continually read from disk in portions while you work, instead of being kept entirely in memory. When they are heavily fragmented, these files create extra work for your hard disk, forcing it to shift its magnetic head to and fro to keep pace with you and your work.

You might also consider optimization when the total fragmentation is low because you need a large free contiguous space to use virtual memory. Some currently available virtual memory applications require a free chunk of disk space at least 8 MB in size. If you have virtual memory, consult the appropriate documentation for suggested operating parameters and use this information when making your decision about whether or not to optimize.

Advanced users might also consider optimizing their disks to provide enough contiguous free space for the purpose of creating partitions. Depending on the size of the partition you

want to create, you might choose to optimize a volume with a low fragmentation percentage just to consolidate free space.

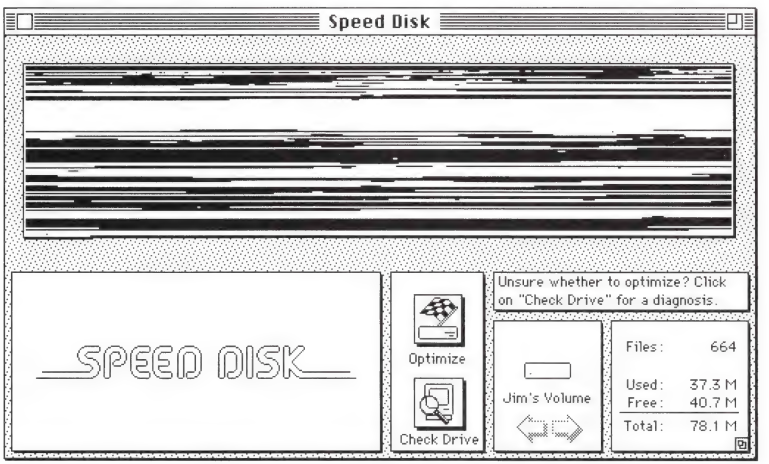
You can drag a disk icon onto the Speed Disk icon to open Speed Disk with that drive selected and ready to be optimized.

Easy Level Speed Disk

The appearance of the Speed Disk window varies depending on whether you select the Easy or Expert level. Easy level is the default; select the Expert command in the Options menu to change to Expert level.

Figure SD-1

The Easy level Speed Disk window



The top part of the Speed Disk window shows a representation of the selected drive. It indicates which parts of the disk are occupied and which are free. Free areas are displayed in white, while occupied areas are shown in black or color (if your Macintosh is color-capable).

Speed Disk magnifies the disk image to fill the screen: the smaller the drive, the greater the magnification. Similarly, the

actual size and appearance of blocks in this image vary from drive to drive, depending on the capacity of the drive selected.

This area of the window changes during optimization as files are moved from one location to another. You can select the Show Pencil command in the Options menu to watch files as they are actually read from and written to disk. The pencil will not appear if color is on, however. In Expert level, TurboCharge also deactivates the pencil.

In the lower-left area of the window is the logo/progress area. When you aren't checking or optimizing a drive, it displays the Speed Disk logo. During the analysis or optimization of a drive, it displays a progress bar and message about Speed Disk's activity.

The bottom center area of the Speed Disk window contains the Optimize and Check Drive buttons. The Check Drive button is used to read directory information from the displayed disk. Speed Disk provides you with a diagnosis after you click this button. Notice that once you click this button, the normally available Optimize button changes to the Stop button. You can stop checking your drive at any point without damaging your files. It is recommended, however, that you check your drive before optimizing it. Doing so will provide you with information upon which you can base your decision to continue. You may discover that your disk is not heavily fragmented and is not in need of optimization, for example.

The Optimize button is used to start actual optimization. If you click this button when the drive selected is your startup drive, a locked drive, or has open files, you will be alerted of the situation. You're given the option to proceed with defragmenting your files if you wish. See the section on screen activity during optimization below for more information on what you actually see during optimization.

The bottom-right area of the Speed Disk window displays the Speed Disk diagnosis after you click the Check Drive button. The diagnosis is based on several factors, including the number of files fragmented, whether or not the directories and the Desktop file are fragmented, and whether or not there is noncontiguous free space. There are seven diagnoses, ranging from "No Need To Optimize" to "This Disk Is Dangerously

Fragmented." Speed Disk also gives you an indication of what kind of performance gain you'll experience by optimizing.

The two boxes below the diagnosis message box allow you to select the volume for analysis, and show information about the current state of that volume. Click on the arrows below the drive icon or use the Tab key to select the currently mounted drive or partition you want to check or optimize.

Optimizing with Easy Level Speed Disk

There are four things to watch for during optimization in the Easy level Speed Disk:

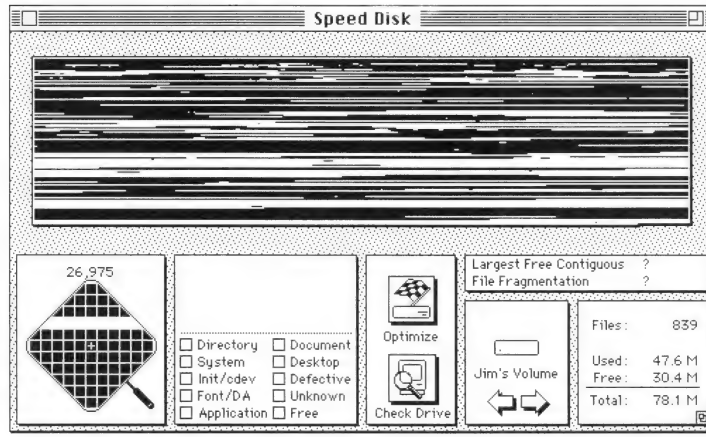
- A horizontal progress bar fills to give an indication of optimization completion.
- A message above this progress bar describes the activity being performed, (for example, "Optimizing System Files").
- Blocks move in the top area of the window in tandem with actual disk activity.
- If selected, the pencil animates the optimization procedure. (To activate the pencil, choose the Show Pencil command in the Options menu; it will not work in color representations).

Expert Level Speed Disk

Access Expert level Speed Disk by choosing the Go to Expert command in the Options menu. The main window changes accordingly.

Figure SD-2

The Expert level Speed Disk window



The top area of the Speed Disk window is identical in both the Easy and Expert level. It displays a graphical representation of the selected drive and indicates which parts of the disk are occupied and which are free. This area changes during optimization to reflect the movement of files from one location to another.

When you move the cursor over this area in the Expert level, you'll notice that the cursor turns into a small magnifying glass. The bottom-left area of the Speed Disk window shows a large magnifying glass, that enlarges the view of the area depicted under the small magnifying glass. The number of the block shown under the center of the small magnifying glass is displayed at the top of this bottom-left area. Dimmed blocks are displayed when part of the small magnifying glass goes beyond the borders of the disk display in the top area.

As in the Easy level, during optimization the bottom-left area displays the progress of the optimization by means of a horizontal progress bar.

After you've checked a drive, the area to the right of the large magnifying glass/progress area displays the filename, file type icon, and total number of blocks that belong to the corresponding file segment shown under the crosshairs of the magnifying glass. Below this information is a file type legend that indicates what type of file you're viewing. A border appearing around a file type, such as "Document," means that the file you're viewing

is of that type. Double-clicking on any file type box in this legend brings up a color wheel with which you can change the color assigned to a particular file type.

This bottom-center area of the Expert level Speed Disk window contains the same Optimize and Check Drive buttons as the Easy level.

The bottom-right area of the window is very similar to the one that appears in the Easy level; however, the diagnosis message is replaced with an estimate of the largest free contiguous space and total fragmentation percentage for the drive selected. It also contains the same drive selection box and file and memory usage information as the Easy level.

Optimizing with Expert Level Speed Disk

After you check a drive but before you actually optimize it, Speed Disk reports the largest free contiguous disk space (a very important figure when using virtual memory) and the total fragmentation percentage for the selected drive. This important information is shown in the message area at the bottom-right of the window. Use it to decide whether or not to optimize your disk.

There are six things to watch for during optimization in the Expert level. The first four are identical to those that occur in the Easy level.

- The progress bar fills horizontally to give an indication of Speed Disk's completion of the optimization.
- A message above this progress bar describes the activity being performed, (for example, "Optimizing System Files").
- Blocks move in the main area in tandem with actual disk activity.
- The pencil animates the optimization procedure, if it is selected.
- Information about the file being currently optimized is shown in the file information box.
- Elapsed time for Speed Disk to complete optimization is indicated below the progress bar.

Speed Disk Menus

With the exception of Go to Expert and Show Pencil in the Options menu, the following menu commands are available only in the Expert level. The Explore menu is not available in the Easy level.

File Menu

- **Quit**
  Use this command to quit Speed Disk and return to the Finder.

Options Menu

- **Go to Expert/Easy**
  Use this command to toggle between the Easy and Expert levels.
- **Show Pencil**
  Displays the pencil in the top area of the Speed Disk window to animate the optimization activity. The optimization activities of "reading" and "writing" data are depicted by eraser-down and lead-down pencils, respectively. The pencil only works in black and white.
- **Prioritize**
  When checked, this command causes Speed Disk to load certain file types first in a predetermined, constant order. With this option unselected, Speed Disk loads whichever files are nearest in a helter-skelter fashion. This becomes most apparent in color representations, where different file types are clearly distinguished. Choose this command to provide the most thorough performance gain at the Finder level, but be aware that doing so will take longer.
- **Verify Media**
  This command is used to confirm the readability of the sectors on the disk you optimize. Speed Disk isolates bad blocks and writes "dummy" files over them, effectively marking them defective or "off limits" for any future disk activity. It is highly recommended that you leave this command selected every time you optimize.

- **Verify Data**
  Select this command for Speed Disk to confirm automatically that data is accurately written to disk before it optimizes. This option provides additional peace of mind. If selected, Speed Disk will double-check each time it writes to disk to ensure that the data was written correctly. Sometimes, due to the nature of magnetic media, information can be written incorrectly, but this option will reduce the likelihood of any data being lost.

- **Erase Free Space**
  With this command enabled, Speed Disk will wipe out any data residing in unused disk space after it finishes optimizing. This is the same as using the Erase Free Space option in the Wipe Info utility. See the Wipe Info reference section for more information.

- **TurboCharge**
  Disables animation and provides only limited updating of the disk map. This increases speed, since your computer can devote all its resources to optimizing. TurboCharge only displays in black and white, even when color is on, for added speed.

Explore Menu

- **Check Drive**
  Identical in function to the Check Drive button at the bottom of the Speed Disk window, this command is used to read in file data from a selected disk. You must first check a drive before Speed Disk can inform you about the total fragmentation, largest free contiguous space, and other relevant information that will enable you to make a decision about optimizing.

- **Check Media**
  This command is used to confirm the readability of the sectors on the disk you optimize. Speed Disk isolates bad blocks and writes "dummy" files over them, effectively marking them defective or "off limits" for any future disk activity. You can use this command to verify media soundness independently of optimization.

- **Check Files**
  Use this command to confirm that file allocation information contained in your directory and elsewhere actually corresponds to the files contained on your disk. For example, an area of a disk can actually be empty when there is a directory entry stating that a file occupies that area. Other discrepancies can also exist. Actions such as copying files from other disks (network file servers, for example) can lead to these discrepancies. Serious misallocations should be corrected using the Norton Disk Doctor before optimizing your disk. You can use this command to verify file allocation independently of optimization.

- **Erase Free Space Now**
  When you choose this command, Speed Disk will wipe out any data residing in unused disk space. This function is the same as choosing the Wipe Free Space option in Wipe Info.

- **Largest Free Contiguous**
  Use this command to calculate the largest whole piece of free space on a disk. This information is particularly valuable if you're using virtual memory.

Utilities Menu

- **All Norton Utilities Applications**
  Use the commands in this menu to transfer directly to the other Norton Utilities applications.

UnErase

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UnErase

UnErase recovers files that have been deleted. As you know, files are deleted by dragging their icons to the Trash, then emptying the Trash. The Trash can be emptied by choosing the Empty Trash command in the Special menu of the Finder. In System 6 and before, it is automatically emptied when you start an application, or shut down or restart your computer.

In System 7, you must choose to empty the trash; it is almost never emptied automatically without some warning, unless you've deliberately turned the warning off. To do so, select the Trash icon in the Finder and type Command-I; there is a "Warning before emptying" checkbox you can deselect in the Trash Info window.

There are also desk accessories and applications that will delete files directly. With the exception of Wipe Info, no matter how files get deleted, only their bookkeeping information is lost—their data is not destroyed. However, since the space the file occupied on your disk is now considered free and available for use by some other file, the data is at risk of being overwritten and lost for good.

The chances of complete recovery are quite good if you haven't saved or copied anything since you threw the file away. However, the longer you wait and the more you write to your disk, the poorer your chances become of rescuing a deleted file. If your disk is very full, you have a greater chance of overwriting a file (and thereby losing it forever) sooner than you would on a nearly empty disk.

UnErase works better if you have activated FileSaver protection prior to deleting a file.

When to Use

Use UnErase when you've thrown a document into the Trash, emptied it, and discover you want the file back. This is all too easy to do if, for example, you throw away several documents at once, or if you use a desk accessory or other utility that allows you to delete files.

If you can't find a file, and you're pretty sure you didn't erase it, you may want to use Fast Find to attempt to locate it. If that doesn't work, try the Norton Disk Doctor. You can also use the Norton Disk Editor to look for information in the file, such as a phrase or sentence in a word processing document.

How to Use

Click the UnErase button on the Norton Utilities for Macintosh Main Window. This starts UnErase.

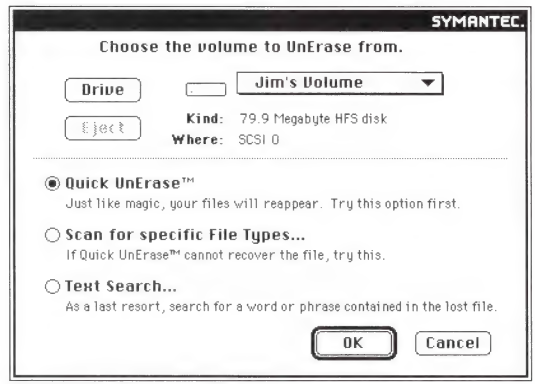
Start UnErase from the Emergency Disk (or better yet, from a backup copy) if the Norton Utilities are not already installed on the hard disk from which you want to recover deleted files. If you haven't installed the Norton Utilities yet, do not install them until after you've recovered your data.

Choosing a Volume

When you start UnErase, you'll see the following Choose Volume/Method dialog box.

Figure UN-1

The UnErase Choose Volume/Method dialog box


SYMANTEC.
Choose the volume to UnErase from.
Drive
Jim's Volume
Eject
Kind: 79.9 Megabyte HFS disk
Where: SCSI 0
Quick UnErase™
Just like magic, your files will reappear. Try this option first.
Scan for specific File Types...
If Quick UnErase™ cannot recover the file, try this.
Text Search...
As a last resort, search for a word or phrase contained in the lost file.
OK
Cancel

First you need to specify which disk to UnErase from. If you're UnErasing from a floppy disk, insert it into an available disk drive. Use the pull-down menu to select the name of the volume you wish to UnErase from.

If the volume does not appear, you may still be able to UnErase from it using the More command in the pop-up menu. When you choose More, the More dialog box appears. Using this dialog box, you can have UnErase scan for three kinds of disk drive information: it can attempt to locate SCSI devices by their ID numbers, it can look for device-driver software, and it can attempt to locate soft partition information. For a complete description of the More dialog box functions, see the "Norton Disk Doctor" reference section.

When you're finished with the More dialog box, you'll return to the UnErase Choose Volume/Method dialog box described earlier.

Selecting the UnErase Method

After you specify which disk to UnErase from, you need to select the UnErase method. There are three UnErase methods available. Each one is explained a little bit on the Choose Volume/Method dialog box shown in Figure UN-1.

- **Quick UnErase**
  This is the fastest and easiest method, but it works best if you've previously activated FileSaver protection. If you haven't, you'll see a dialog box informing you of that fact.

- **Scan for Specific File Types**
  In this method, UnErase looks for documents that belong to specific applications. You must choose the application document type to look for.

- **Text Search**
  As a final resort, you can search for specific text in the file you want to recover. You have to recover each chunk of it individually; however, UnErase lets you merge pieces of the file into a single document.

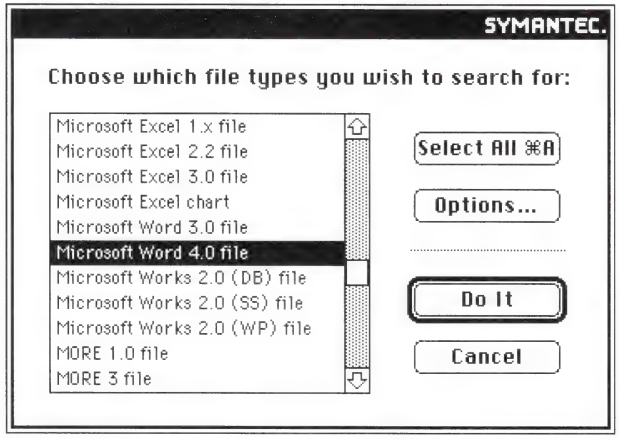
Click the option button next to the UnErase method you wish to try, then click OK to proceed.

When you select Quick UnErase, your disk is scanned for erased files. If you haven't activated FileSaver protection, a message appears. Otherwise, the UnErase main window appears with a list of files that can be UnErased.

When you select the Scan for Specific File Types option, a dialog box appears and you're asked to indicate what kind of documents to look for.

Figure UN-2

The File Types dialog box

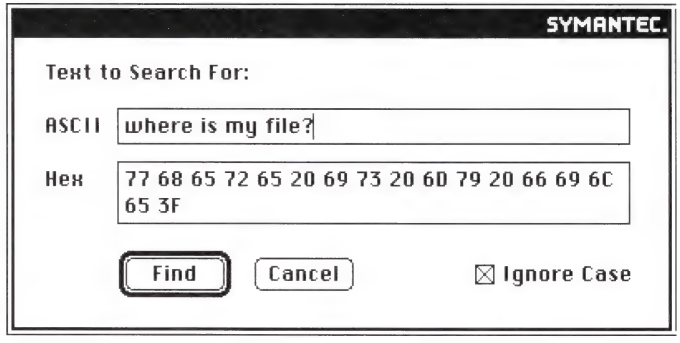


Scroll through the file list to find the file type you want to UnErase, then click it to select it. It's possible to select more than one file type: just hold down the Shift key as you select file types and each selected file type will be highlighted. Click Do It to proceed to the UnErase main window.

Finally, when you choose the Text Search option, a dialog box appears as you click OK.

Figure UN-3

The Text Search dialog box



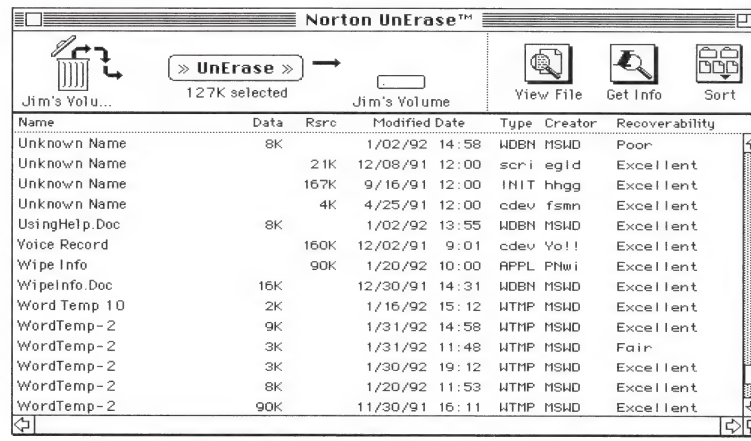
Type in the text you wish to search for; a unique phrase or a sentence is usually sufficient. As you type in the ASCII (normal text) field, the equivalent hexadecimal representation appears in the Hex field, and vice versa. (You don't need to know anything about hexadecimal notation to use the Text Search feature in UnErase.) If you want UnErase to ignore distinctions between upper- and lowercase letters, keep the Ignore Case option selected as shown above, otherwise click it to deselect it. Click Find to begin the search.

UnErasing

Whichever option you choose, UnErase compiles a list of files that can be UnErased. These are displayed in the UnErase main window, which also contains the controls you use to select and UnErase individual files.

Figure UN-4

The UnErase main window


Norton UnErase™
Jim's Volu...
» UnErase »
127K selected
Jim's Volume
View File
Get Info
Sort
Name Data Rsrc Modified Date Type Creator Recoverability
Unknown Name 8K 1/02/92 14:58 WDBN MSWD Poor
Unknown Name 21K 12/08/91 12:00 scri egld Excellent
Unknown Name 167K 9/16/91 12:00 INIT hhgg Excellent
Unknown Name 4K 4/25/91 12:00 cdev fsmn Excellent
UsingHelp.Doc 8K 1/02/92 13:55 WDBN MSWD Excellent
Voice Record 160K 12/02/91 9:01 cdev Yo!! Excellent
Wipe Info 90K 1/20/92 10:00 APPL PNwi Excellent
WipeInfo.Doc 16K 12/30/91 14:31 WDBN MSWD Excellent
Word Temp 10 2K 1/16/92 15:12 WTMP MSWD Excellent
WordTemp-2 9K 1/31/92 14:58 WTMP MSWD Excellent
WordTemp-2 3K 1/31/92 11:48 WTMP MSWD Fair
WordTemp-2 3K 1/30/92 19:12 WTMP MSWD Excellent
WordTemp-2 8K 1/20/92 11:53 WTMP MSWD Excellent
WordTemp-2 90K 11/30/91 16:11 WTMP MSWD Excellent

A scrolling list of UnErasable files is shown at the bottom of the window. Information is displayed in seven columns from left to right. The first column shows the file's name, if it is known. The second shows the size of the file's data fork. The third column shows the size of the file's resource fork while the fourth displays the date and time at which the file was last modified. The fifth and sixth columns display the file's type and creator.

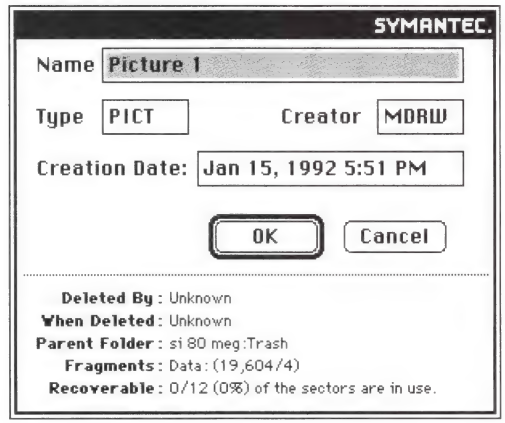
The last column is in many ways the most important: it gives UnErase's assessment of the prospects for recovering the file.

Click a filename to select the corresponding file. At the top of the screen are four buttons that control the UnErase process.

View File brings up a small text window displaying the initial text contents of the file. This allows you to check and make sure the selected file is actually the one you want to recover. Get Info is similar to the Get Info command in the Finder File menu. It brings up a dialog box that shows you information (which you can edit at your own risk) about the selected document's attributes, the application that created it, when it was deleted (if known), and so on.

Figure UN-5

The Get Info dialog box



Sort brings up a pop-up menu that allows you to specify what order to show files in. Finally, clicking the UnErase button UnErases the selected files. You'll see a warning about recovering to the same disk that you're recovering from. Files are recovered to the Recovered Files folder.

UnErase Menus

Additional UnErase options and controls are contained in the following menus

File Menu

- **Start Over**
  Begins a new UnErase session without terminating the old session. The Choose Volume/Method dialog box reappears.
- **Close**
  Closes the currently active window without quitting UnErase.
- **Page Setup**
  Brings up the Page Setup dialog box. You can specify page size, orientation, and other options in preparation for printing.
- **Print**
  Prints the UnErase files list.
- **Quit**
  Quits UnErase.

Edit Menu

- **Select All**
  Selects all the files shown in the UnErase list.

All other Edit menu commands are unavailable in UnErase.

Options Menu

The View File and Get Info commands in this menu duplicate the buttons on the upper right of the UnErase main window.

- **Change Destination Folder**
  Allows you to change the folder in which UnErased files will be stored.
- **Change Destination Volume**
  Allows you to change the volume in which UnErased files will be stored.

UnErase Menu

This menu contains special UnErase options that are particularly useful for Text Search UnErase and for maximizing the efficiency of partial file recovery.

- **UnErase**
  Same as the UnErase button on the UnErase main window.
- **Save As**
  Allows you to name the UnErased file.
- **Append To**
  Attaches the contents of the UnErased file to another file that you specify. For example, you can attach UnErased text to the end of an existing word processing document.
- **Save Text Only**
  This command extracts the text from the selected file and UnErases it. This option is useful for getting the most out of a document whose recovery prospects are less than excellent. UnErasing the complete file contents might result in a document whose creator application may refuse to open. By UnErasing text only, you can recover most of a file's information.
- **Save Text As**
  Allows you to UnErase the text of a selected document, giving it a new name that you specify.
- **Append Text To**
  Merges the text of the selected document with another document you specify. You can accumulate text fragments of an erased file this way.

Utilities Menu

Use the commands in this menu to transfer to other Norton Utilities for Macintosh.

Volume Recover

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Volume Recover

Volume Recover can undo accidental initializing of hard disks. It can also recover files from disks—floppy and hard—whose record-keeping information is very badly damaged.

Unfortunately, initializing a floppy disk completely erases all information stored on it. Some formatting utilities that are provided with hard disks also completely erase all information. Disks that have been low-level formatted cannot be restored, even if protected with FileSaver.

We've said it before, and we'll say it again: don't save documents or applications to a disk that has been damaged or contains data to be recovered! You might accidentally overwrite the data you intend to recover. Once overwritten, data is absolutely gone for good. Do not install the Norton Utilities for Macintosh on a damaged disk if they aren't already there. Finally, if your startup disk is damaged, start your Macintosh with the Emergency Disk provided (or, better still, with a backup copy) and start the Norton Utilities from there.

When to Use

Use Volume Recover to recover data from a badly corrupted or restore an accidentally initialized hard disk, provided you've installed and activated FileSaver protection prior to the crash. With FileSaver activated, every time you shut down your Macintosh, a "snapshot" of your hard disk is created and stored. Volume Recover uses this information to restore your disk's essential record-keeping information.

See the "FileSaver" reference section for information on how to install the FileSaver startup document and how to activate FileSaver protection on a disk.

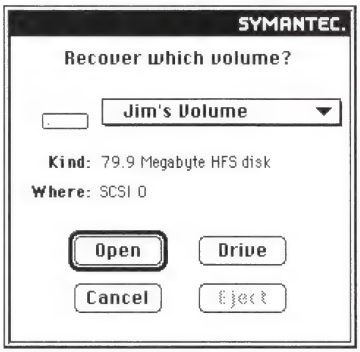
If you've accidentally initialized a hard disk and have not installed FileSaver, chances are much of your data can still be recovered. See the *User's Guide* for more information.

How to Use

Start the Norton Utilities for Macintosh and click the Volume Recover button on the Main Window. The Volume Selection dialog box appears.

Figure VR-1

The Volume Selection dialog box



At the top of this dialog box is a pop-up menu. It lists all currently available drives. You can select the drive to restore from among those listed in the menu. You can also choose Scan SCSI Bus to have Volume Recover search for SCSI drives that it didn't find the first time. If the volume you want to recover doesn't appear in the list above, you can use the More command in the pop-up menu. Doing so brings up the More dialog box. See the "Norton Disk Doctor" reference section for a complete discussion of the More dialog box functions.

When you're finished with the More dialog box you'll return to the Volume Selection dialog box.

There are four buttons in this dialog box. Open tells Volume Recover to proceed with restoring the current drive selection. The Drive button cycles through the list of available drives; it is another way, along with the pop-up menu, of selecting which drive to restore. Eject is used to eject a floppy disk so you can insert a damaged disk to repair. Cancel exits Volume Recover without taking action.

Volume Recover in Action

When you click Open, Volume Recover looks for FileSaver information on the selected drive. When it finds this information, it shows you the following dialog box.

Figure VR-2

The FileSaver Found dialog box

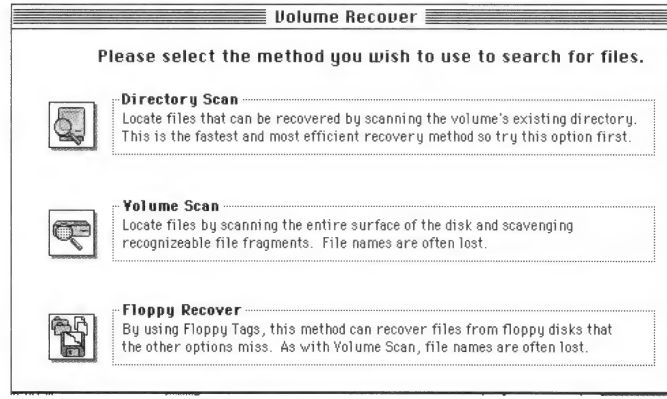
SYMANTEC.
FileSaver information has been found for "si 80 meg".
Last updated: Jan 17, 1992 12:39 PM.
Do you want to completely restore the disk using this information?
Restore
Restore this volume.
Keep looking
Search for more recent FileSaver information.
Other methods
Use other recovery methods to locate the files.
Cancel
Do not restore this volume.

Volume Recover displays the date and time that the FileSaver information was created. You have four options. You can instruct Volume Recover to recover the volume using the current information by clicking Restore. To search for other, possibly more recent FileSaver data, click Keep looking. If you wish to attempt other recovery methods not relying on FileSaver, click Other methods (this is most useful when no FileSaver data is found; Volume Recover informs you when it can't find any FileSaver files). To exit Volume Recover without attempting recovery, click Cancel.

If there is no FileSaver information on the drive you wish to recover, you may still be able to rescue data from it. Click the Other methods button. When you do so, the Other Methods dialog box appears.

Figure VR-3

The Other Methods dialog box


Volume Recover
Please select the method you wish to use to search for files.
Directory Scan
Locate files that can be recovered by scanning the volume's existing directory. This is the fastest and most efficient recovery method so try this option first.
Volume Scan
Locate files by scanning the entire surface of the disk and scavenging recognizeable file fragments. File names are often lost.
Floppy Recover
By using Floppy Tags, this method can recover files from floppy disks that the other options miss. As with Volume Scan, file names are often lost.

You have a choice of three recovery methods, although one is intended only for floppy disks that support tags. You can have Volume Recover scan for the disk's existing directory structure. You can also scan the entire volume for file fragments using the Volume Scan method. The Floppy Recover method recovers data from certain floppy disks. If you should attempt this method on a floppy disk that does not have tags, a dialog box will inform you of the fact. You have to option to attempt recovery anyway.

Directory Scan yields the best results, providing that the disk's directory information is still in relatively good condition. (Unfortunately there is no way to determine its condition beforehand, short of looking through the directory files with the Norton Disk Editor.) If the directory files turn out to be badly damaged, the Directory Scan method is still useful, but not all files will be recovered and many file names will be lost.

If a disk has been initialized, the Directory Scan method may not work; however, you can try using the Volume Scan method, particularly if the hard disk in question was erased using the Finder's Erase Disk command (in the Special menu).

As for floppy disk tags, whether a given floppy disk has them or not depends on when and under what system it was last formatted. Support of floppy disk tags has been erratic, with some versions of the system including them and some not. It can't hurt to try this last method to recover data from a floppy disk, however. Again, please be aware that a floppy disk that was erased using the Finder's Erase Disk command is gone for good. If, however, the contents of the disk were merely dragged to the Trash, odds are quite good that data can be recovered, particularly if no new data was stored on the disk in the meantime.

Wipe Info

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Wipe Info

Wipe Info represents a point of departure from the traditional focus of the Norton Utilities for Macintosh. The other utilities are designed to protect, rescue, and improve access to your data. Wipe Info, on the other hand, is designed to destroy data. Permanently. Even the Norton Utilities cannot recover data from a disk or a file that has been wiped with Wipe Info.

When to Use

When you empty the Trash or erase a hard disk, the data involved is not actually destroyed. Only the bookkeeping information is modified. The space formerly occupied by the file or files is made available for other files. Only when another file is stored over the formerly occupied space of a deleted file is the data actually lost.

Clearly this poses a security risk. After all, the Norton Utilities themselves are designed to rescue deleted files and formatted hard disks. Armed with a copy of the Norton Utilities, a determined data snoop can recover data that you may have erased. It's a bit like having someone rifling through your garbage.

Businesses use paper-shredders to prevent sensitive data from leaking out through the garbage. And now you can use Wipe Info to prevent sensitive data from leaking out through your Trash.

Wipe Info "zeroes out" old data by writing new, meaningless data over the top of it. The program can be configured to conform to Department of Defense security specifications, which call for three passes. In the first pass, zeroes are written over your old data; in the second, ones are written over the zeroes. Finally, a preset pattern of characters is written. In any case, data wiped with Wipe Info is permanently and irretrievably lost.

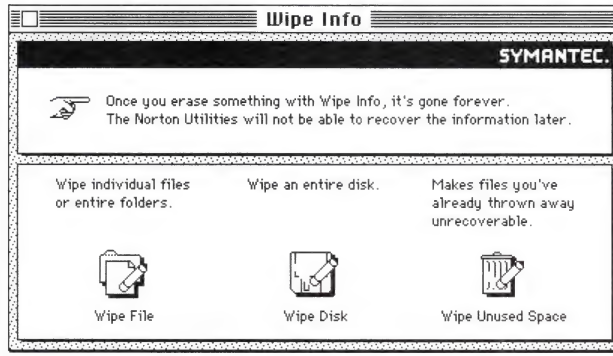
You can create a Wipe Info Trash from the Options menu. This special Trash is in addition to the regular Finder Trash. Items dragged to the Wipe Info trash are permanently wiped, after you confirm that you wish to do so within a confirmation dialog box that appears. Read more about this feature in the section on the Options menu.

How to Use

Start Wipe Info by clicking its icon in the Norton Utilities folder. The Wipe Info main window appears.

Figure WI-1

The Wipe Info main window


Wipe Info
SYMANTEC.
Once you erase something with Wipe Info, it's gone forever.
The Norton Utilities will not be able to recover the information later.
Wipe individual files or entire folders.
Wipe an entire disk.
Makes files you've already thrown away unrecoverable.
Wipe File
Wipe Disk
Wipe Unused Space

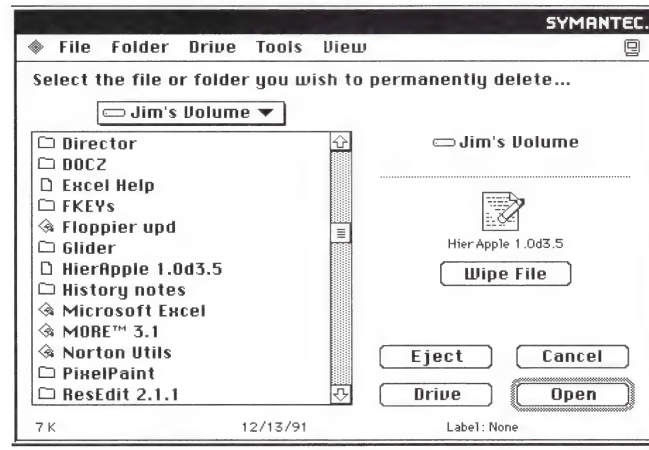
The window has three buttons, corresponding to the three options available using Wipe Info. You can wipe out a single file or folder (or several). And you can wipe an entire disk. You can also wipe only the free space on a disk. This last option will destroy any data left over from files that you've dragged to the regular Trash. Pressing any of these buttons brings up a dialog box in which you must specify exactly what or where to wipe.

Wiping Files and Folders

When you click the Wipe File button on the Wipe Info main window, the File/Folder Selection dialog box appears.

Figure WI-2

The File/Folder Selection dialog box



On the left of the dialog box is a scrolling list. Scroll through this list until you find the file or folder you want to wipe; click its name to select it.

To the right of the scrolling list are five buttons. Click Wipe File to begin wiping the selected file or folder. You're asked to confirm your decision. You can cancel the operation at this point if you change your mind or discover you've made a mistake. (Once you confirm your selection, that file will be irretrievably erased.) Click Eject to eject a floppy disk so you can insert another disk. Cancel leaves the dialog box without taking action, Desktop changes drives, and Open opens a selected folder.

Wiping Disks

When you click the Wipe Disk button on the Wipe Info main window you're taken to the Wipe Disk Volume Selection dialog box. Here you specify which disk you want to wipe.

Figure WI-3

The Wipe Disk Volume Selection dialog box

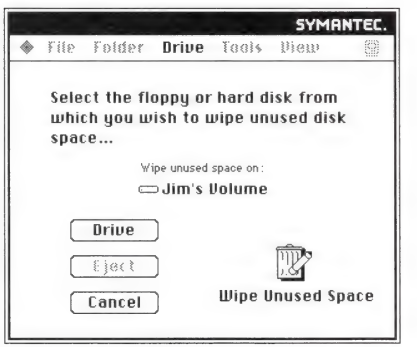
There are four buttons on this dialog box. The three to the left control the drive selection. Use Eject to eject a floppy disk so that you can insert the one you want to wipe; click Drive to cycle through the list of available disks until the name and icon of the one you want appears above the buttons. Click Cancel to terminate the procedure without wiping. When you've made your choice, click the Wipe Entire Disk button on the right side of the window. You are asked to confirm your choice.

Wiping Unused Space

When you click the Wipe Unused Space button on the Wipe Info main window you're taken to the Wipe Free Space Volume Selection dialog box. Here you specify the disk whose free space you want to wipe.

Figure WI-4

The Wipe Free Space Volume Selection dialog box



There are four buttons on this dialog box. The three on the left control the drive selection. Use Eject to eject a floppy disk so that you can insert the one you want to wipe; click Drive to cycle through the list of available disks until you see the name and icon of the one you want above the buttons. Click Cancel to terminate the procedure without wiping. When you've made your choice, click the Wipe Unused Space button on the right of the window. You'll be asked to confirm your choice. Once you wipe the free space on a disk, you cannot use UnErase to retrieve previously deleted files on that disk. Files that you delete subsequent to wiping free space can be retrieved.

If you really want to bypass the Wipe Info confirmation dialog boxes, hold down the Option key when you click the appropriate Wipe button (Wipe File, Wipe Entire Disk, or Wipe Unused Space).

System 7 users can hold down the Option key when dragging an item to the Wipe Info Trash; this also bypasses confirmation dialog boxes.

Wipe Info Menus

You can access all of Wipe Info's functions using the following menus. Additional options are available to you only through the menus, particularly the Options menu.

File Menu

- **Quit**
  Exits Wipe Info and returns you to the Finder.

Wipe Menu

- **Wipe File/Folder**
  Takes you to Wipe File/Folder Selection dialog box. Same as clicking the Wipe File button on the Wipe Info main window.
- **Wipe Entire Disk**
  Accesses the Wipe Disk Volume Selection dialog box. Same as clicking the Wipe Disk button on the main window.

- **Wipe Unused Space**
  Brings up the Wipe Free Space Volume Selection dialog box. Same as clicking the Wipe Unused Space button on the main window.

Options Menu

- **Create Wipe Info Trash**

Allows you to create a Wipe Info Trash, which appears in the lower-left corner of the desktop. This special Trash lets you immediately wipe any files or folders by dragging their icons to the Wipe Info Trash. The regular Finder Trash is not affected.

Many System 7 users may prefer to use Wipe Info in this manner; it saves having to start Wipe Info. If the application is removed from your hard drive, the Wipe Info Trash will no longer work, however.

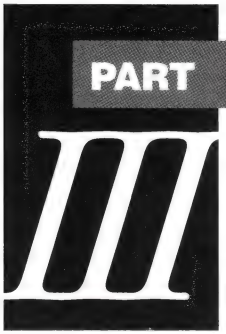
If you drag an alias to the Wipe Info Trash, the alias's target file (the one containing the actual data) will be destroyed and not the alias file. This is different from standard Trash behavior. Dragging an alias to the Wipe Info Trash destroys any and all data associated with the alias file. If you merely wish to delete an alias, not the file it's associated with, drag the alias to the regular Finder Trash.

If you drag a volume icon or its alias to the Wipe Info Trash, all the free space on that volume will be wiped.

- **Government Wipe**
  Instructs Wipe Info to use the United States Department of Defense security specifications for wiping data. Operation will be slowed considerably, but data will be out of reach of even the most sensitive electronic retrieval equipment.

Utilities Menu

Use the commands in this menu to transfer to other Norton Utilities for Macintosh.



Norton Disk Companion

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Introduction

In many ways, disks are the most important part of your Macintosh, even though flashier parts get more attention. Of course, the characteristics of your central processing unit (CPU) are very important, as it's there that data are crunched, compared, calculated, and otherwise manipulated to yield perfectly formatted letters and precisely balanced accounts. The faster your CPU runs, the more you can get done in a fixed span of time.

The amount of working storage space, or random-access memory (RAM), available to your CPU is also important. Your Macintosh stores documents (or parts thereof) in RAM while it works on them. With more and more space, you can work on more and more data, whether it's several documents within a single application or several applications running at the same time.

However, RAM is not forever. In order to remember data, RAM requires power, whether it's a steady trickle of current from a laptop's batteries or a more sizeable stream of electricity from your Macintosh's transformer, which itself draws power from the wall outlet. Any interruption in power, however brief—from a dead battery to a citywide blackout—and everything stored in RAM is lost for good.

Clearly a computer needs a safer, more nearly permanent place to store data. That's where disk drives come in. All of your data—your letters, memos, spreadsheets, databases, drawings, and the application programs that create them—are stored on disks. When you wish to work on a particular document, your Macintosh searches the appropriate disk for the document's data. When you want to record changes to the document, changes are recorded (written) back to the disk. When you want to work with the document again, the next day or the next month, it's there waiting for you on disk, just like you left it.

By the way, disk storage is also much cheaper than RAM. On the margin, RAM costs from $40–150/MB (about one million characters; approximately 800 typed pages), whereas disk storage costs $4–15/MB.

Disks, then, are something you rely on from day to day, yet no other part of the computer is more subject to the slings and arrows of outrageous fortune. All of us have stored important

documents on disks that were fine one minute and broken the next. ("This disk is unreadable. Do you want to initialize it?") Well, to understand what can go wrong with a disk—whether it's an 800K floppy disk or a 600 MB hard disk—and to learn how such damage can be repaired, you need to know a little bit about how disks work.

That's what this part of this user's guide is all about.

About the Disk Companion

This part of the user's guide presents a brief tour through the inner workings of Macintosh disks. We'll begin by examining disks and disk drives as hardware: how they're made, how they work, and what the various parts are called. We'll look at the basic "building blocks," such as platters, heads, tracks, and cylinders, and see how they're put together to make a disk drive.

Next, we'll examine the way information is stored on a disk. We'll look at fundamental bookkeeping areas such as the boot blocks, the volume bit map, and the catalog and extents trees. We'll show how documents are stored on a disk. We'll step through the processes of creating, opening, saving, and deleting a document to show how all these pieces work together.

Lastly, we'll discuss what kinds of things can go wrong with disks and how some of these problems can be fixed using the Norton Utilities for Macintosh. We'll look at problems that affect your entire computer system, problems that affect entire disk volumes, and problems limited to single documents.

The Hardware

Considering the reputation for complexity that disks—particularly hard disks—seem to have, it's surprising how simple the basic concepts behind them really are.

Although you've probably heard it said many times, it bears repeating that disks—both floppy and hard—depend on the same phenomenon as audio or videotape recorders to store their data: A recording head magnetizes microscopic particles

embedded in a surface; moving the particles past the magnetized head causes the particles to become magnetized.

In an audio tape—and a digital computer tape, too, for that matter—the magnetic medium is simply a long string of plastic tape embedded with metal particles. (Incidentally, the most popular metal particle among tape manufacturers is iron oxide, otherwise known as rust. Floppy disk surfaces are brown because they're covered with rust.) But there's nothing magic about that long, thin shape. You could successfully create a magnetic recorder with a medium of any shape, provided you could master the mechanics of moving the medium past a recording head.

Tracks

Imagine touching your index finger to an ink pad and then holding it just above a record spinning on a turntable. If you were to touch the spinning record lightly with your inky finger, you'd leave a finger- width ring of ink on the record. Now imagine that the record is a floppy disk and your fingertip is a magnetic read/write head. The inky trail your finger left on the disk would then have an official name: a *track.*

By applying a digital signal to the read/write (recording) head, we can record information on the floppy disk track in exactly the same way we could record it on an audio tape. The only difference is that with an audio tape, we would record a continuously variable signal representing a sound waveform; on a floppy disk, we'd record either a maximum signal or nothing at all. In other words, on an audio tape we'd record an *analog* signal, while on a disk, we'd record a *digital signal.*

Back on the circular track on our floppy disk—physics dictates that the the tracks be fairly thin for the magnetic heads to function correctly. That means our single track of data on the disk occupies only a fraction of the total disk area. But just as you can record two, four, or more tracks on a single audio tape, so is it possible to record multiple tracks on a single disk. And just as with audio tapes, we can record multiple tracks in either of two ways: we can add more heads, each positioned to record its track inside the previous one, or we can move a single head back and forth across the disk.

The first method is expensive but fast, since it allows you to record multiple tracks simultaneously. The second method—stepping a single head across the disk—is slower but far more economical, and it's the method chosen by most manufacturers (However, some high-performance drives do use multiple heads per disk surface to achieve speed.)

Double-Sided Disks

So far, we've considered only one surface of a floppy disk. But just like records, floppy disks have both a top side and a bottom side, and there's nothing to prevent disk manufacturers from treating both with a magnetic coating, allowing us to record on both the top and bottom surfaces. (In that respect, disks are a bit different from tape, which is coated and recordable on only one side. The opposite is actually true of floppy disks: a disk coated with magnetic material on only one side tends to warp.)

Recording on both sides of a disk yields economies of scale. A disk drive that records on a single side needs a motor to spin the disk, an apparatus to hold the head against the disk, a second motor to move the head back and forth across the disk, a chassis to hold the whole works, and so on. To record on the flip side doesn't require the addition of yet another chassis, motor, or much of anything else. All it requires is a tweak to the apparatus that holds the head—it now becomes a pincer-like affair—and the addition of a second head to the bottom fork of the pincer.

The original 400K disk drives shipped with the first Macintosh computers only recorded data on one side. (They also used a different method of keeping track of your applications and documents. We'll discuss this shortly.) Eventually Apple switched to 800K disk drives, in which data is recorded on both sides of the disk. The 1.4MB drives included with the Macintosh II family, for example, use smaller tracks to crowd more data onto each disk side.

Cylinders

There's another benefit to recording on both sides of a disk: twice as much data can be written before the head has to be moved from one track to the next. Data can be written first to

the track on the top side of the disk, then, without movement of the head, more data can be written to the track on the bottom side. The pair of tracks that lie over each other and can be written without movement of the head assembly are collectively referred to as a *cylinder*.

For convenient reference, both cylinders and tracks are numbered. The outermost track is called track 0; the track on the top side of the disk is called track 0, side 0, and the track on the bottom is called track 0, side 1. Or you can refer to both track 0s together as cylinder 0. Macintosh 800K floppy disks have 80 cylinders, numbered from cylinder 0 (nearest the rim) to cylinder 79 (nearest the spindle).

Let's finish our tour inside a disk drive. So far, we've mostly been describing the double-sided, two-headed floppy disk drive in fine detail. On a floppy disk, the recording head actually sits directly on the disk's magnetic coating. While this allows the head to read and write the strongest signal possible (the strength of the signal falls off quickly as the distance between the head and the magnetic surface increases), it has some drawbacks. Friction, for example, limits the speed at which the disk can spin. Then there's the vexing problem of keeping the head in constant contact with the flexible disk surface, and the equally vexing problem of designing a head that doesn't try to imitate a chisel. Since the speed of rotation directly affects the reading speed—you can't read data from the disk any faster than they rotate by the head—floppy disks are thus slow by their very nature.

An alternative approach—the one adopted by hard disks—is to hold the head slightly above the disk, so that friction between the head and disk, minor irregularities in the disk surface, and wearing of the disk surface by the head all cease to be problems. A whole other set of problems arises with this approach, however. To start with, since the strength of the signal read from or recorded to the disk decreases exponentially as the distance between head and disk increases, it's imperative that we keep the head as close to the disk as possible, yet keep it far enough away so that we're in no danger of touching it either as components heat up and expand or because of imperfections in the disk surface.

Hard Disks

The hard disk designer's rather elegant way of meeting these requirements has been to turn the recording head into a miniature glider.

The hallmark of a hard disk system is the layer of air whipped up by the rapidly spinning disk that the head actually floats on. As you can imagine, that layer of air is very thin. At about 10 microinches (*millionths* of an inch), it doesn't even raise the head enough for a human hair to slide between the bottom of the head and disk surface.

While that's mostly an advantage, since we want to keep the head as close to the surface as possible without touching it, it does preclude the use of a floppy-disk-type flexible backing for the magnetic coating; it simply wouldn't do to have a floppy disk spinning at several thousand rpm, waving around and flapping into the head just microinches above it.

The key element of a hard disk, then, is a magnetic head gliding a few microinches above a very rigid surface. Because the head must be kept extremely close to the surface, it it becomes imperative to "post a no-trespassing sign" for particles that might otherwise lodge between the head and the disk surface, lest the glider crash into the particle and land on the disk, taking a large byte out of your data. That, in turn, requires sealing the entire head-disk assembly (HDA) and microfiltering the air within the chamber. The requirement to keep fine junk out of the HDA necessitates that that part of a hard disk always be assembled in a clean room, a factor that permanently raises the price of hard disks.

With its clean-room assembly, so much of the cost of a hard disk comes in manufacturing the HDA that it makes sense to squeeze as much in as possible. And just as adding a second head to a floppy disk drive increases the manufacturing cost a minimal amount, so does slipping an extra disk platter or two into the HDA raise the manufacturing cost by only a small increment. Typical 20 MB hard disks will have two disk surfaces, or platters, mounted on the same spindle, and four heads—one for each side of each disk—mounted to a single arm and moving in tandem.

The scheme for numbering the sides of a multiplatter hard disk is simply an extension of that for numbering a double-sided drive. The top of the first platter is side 0, its bottom is side 1, the top of the second disk platter is side 2, and its bottom is side 3. And just as both top-side and bottom-side track 0s on a double-sided drive can collectively be called cylinder 0, so can the four track 0s in a two-platter drive be collectively referred to as cylinder 0.

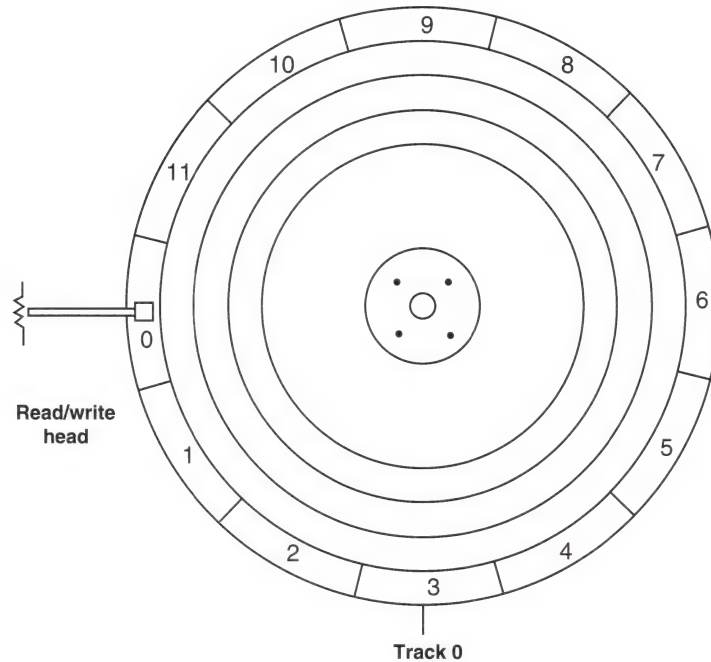
The amount of data that can be jammed into a single circular track on a hard disk depends on the data-encoding scheme used. With current encoding schemes (mostly variants of a technique called MFM, or modified frequency modulation), 8–18K per track can be reliably read and written.

Sectors

Although it would be possible to write and read data from a disk in blocks of 8K or 18K at a time, that number was historically considered too large to be practical. Disk controllers, both floppy and hard, are therefore designed to read and write only a segment of a track at a time. The particular number of bytes in each segment, more commonly known as a sector, depends on the disk controller hardware and the operating system. Disk manufacturers design disk controllers to support several different sector sizes, and the operating system developers choose from among the available sizes. Most Macintosh disks have 512-byte sectors.

On a floppy disk, it is possible to squeeze up to 18 sectors per track, although the number of sectors per track on 400K and 800K Macintosh disks varies from 8 (inside tracks) to 12 (outside tracks). Older floppy drives had variable-speed motors so that the outer, larger tracks could be scanned completely in about the same time as the inner, smaller tracks.

Figure NDC-1
Sectors on a Disk



Read/write head positioned over track 0, sector 0

With their higher rotational speeds, rigid surfaces, and far more stringent manufacturing tolerances, hard disks can hold both more tracks per side and more sectors per track. The most dramatic improvement comes from cramming in far more tracks per side than is possible on a floppy disk. A typical hard disk may have well over 600 tracks per inch. (As you can imagine, accurately positioning the head over each one of those very thin tracks requires some tight manufacturing tolerances. That's why multiple-platter hard disks are so popular—it costs no more to move six heads at a time across three platters than it does to move two heads across a single platter.)

Hard disks can also support more sectors in a given track, though here, the improvement is not nearly as dramatic.

While dividing the track into sectors solves certain problems—there's less data to buffer, for one thing—it creates a new problem. Now we not only need to specify a side and track to find a given piece of data, we also need to indicate what sector number within the track we want. (We'll discuss how to overcome this problem shortly.)

Higher data capacity is one of the two major advantages hard disks have over floppy disks; the other is speed. Speed, however, can be measured in lots of ways. At this point, we need to introduce a few terms related to disk speed.

Some New Terms

If you read advertisements or spec sheets for hard disks, you're likely to encounter a number of terms used to measure disk performance. In particular, the expressions *seek time, access time, latency*, and *transfer rate* keep popping up in any discussion of disk performance.

- **Seek time**
  Seek time is simply the length of time the disk head takes to move from whatever track it happens to be on, to whatever track you want to read. Since that obviously varies each time you read—depending upon where the head was and how far it has to go to get to the desired track—there are different varieties of seek time, the most important of which is *track-to-track seek time.*

  > **Track-to-track seek time**: is the length of time required to move from one track to an adjacent track. Track-to-track seek times have been generally on the order of 8–10 milliseconds. Seek times for floppy disks are many times greater than those for hard disks.

- **Access time**
  Access time is the time required for the head to *seek*—move to, that is—the track that holds the data you want. Clearly, if you left the disk head on track 3 after your last read and you now want to read data from track 4, the access time would be equal to the track-to-track seek time. But how often will you be lucky enough to have the next track you want to read adjacent to the track you

just read? (Actually, more often than you might think. Especially if you're a regular user of Speed Disk.)

Average access time: Average access time is a measure of the time it takes, on average, to move the head from the current position to the track you want to read. At first glance, it might seem that average access time would be equal to the time required to seek across half the number of tracks on the drive. That would be true *only* if the head were always left at the edge of the disk. But after a disk operation, the head may be left anywhere over the disk—the optimal situation would be when it was left in the center of the disk, since then the next access would, on average, be across *half* of half the total number of tracks, or one-fourth the total.

If you're thinking that the average access time must be somewhere between the time required to seek across one-fourth and one-half the total number of tracks, you're right on target. As it turns out, it can be shown that the average time to access any arbitrary track is equal to the time required to seek across *one-third* of the tracks.

- **Latency**

  Two requirements must be satisfied before the disk head can begin reading data. First, it must move to (seek) the required track. Second, the particular sector of the track that is going to be read (or the sector that will be read first, for multiple-sector reads) must spin around under the head. As we've just learned, the average time required for the head to get to the target track is called the average access time. Once the head is positioned at the right track, the time the head spends idle until the right sector comes around is called latency.

  Average latency: Average latency is the time required for the disk to make half a revolution. Hard disks spin at 3,600 rpm, or one revolution every 16.67 milliseconds, so the average latency is approximately 8.3 milliseconds. This figure doesn't vary from drive to drive, so latency time won't help you compare one hard disk with another. But it's interesting to note that floppy disks, spinning at 300

rpm, have an average latency of more than 100 milliseconds, ten times greater than the average latency for hard disks.

- **Transfer rate**
  Transfer rate is the speed at which bits are read from the disk; that is, the speed at which they can be transferred from the disk to your Macintosh.

  Transfer rate depends both on how fast the disk is spinning—you can't read a bit until you get to it—and on how densely bits are packed around the track. Here again, hard disks dramatically outperform floppy disks, both because of the hard disks' higher rotational speed and because of their higher bit-packing density.

  Since almost all Macintosh hard disks use the Small Computer Systems Interface (SCSI) port, they all have the same transfer rate: essentially 232 Kbits/second. SCSI accelerators are now available that boost this figure into the megabit (Mbit) range. Floppy disks, which rely on serial communications (and older hard disks that use the serial ports) are very much slower. Serial data transfer rates are on the order of 80 Kbits/second. The Macintosh IIfx has optimized serial circuitry that improves serial data transfer.

Sector Addressing

Earlier we mentioned an obscure specification of disks called the latency time—the amount of time spent waiting for the data we want to rotate around under the head, after we have moved to the track we want. What we're really waiting for is the particular sector we want to come flying by. So the question is, how do we recognize that sector when we see it?

Early (non-Macintosh!) floppy disks took a brute-force approach to sector identification. Holes were punched at regular intervals around the circumference of the disk, and each hole, which could be mechanically sensed, marked the beginning of a sector. This method was called *hard sectoring*.

Apart from being rather inelegant, hard sectoring didn't adapt well to high-performance drives. A less primitive means of sector identification was therefore developed, one that involved

encoding each sector's address into the sector's data. (Sectors are numbered sequentially around the track, so a sector's address is simply its sequence number around the track.) This approach came to be known as soft sectoring. (Ever wonder why floppy disk boxes used to say "soft sectored?" Now you know.)

By the way, to this point we've been describing strictly physical characteristics of a disk drive: the number of tracks and sides, the size of each sector, access times, and so forth. All of these are characteristics that are determined by the hardware—by the design of the drive itself and that of the controller.

Now, before we can read a sector, we have to put some kind of identifying marker on it. With hard sectoring, holes are punched in the disk, and we use those as a reference in finding each sector. With soft sectoring, before the disk is first used, the sector address of each sector is actually written into the sector itself. (This address stamping takes place during the formatting—also known as initialization—of the disk.) The address goes into a kind of preamble to the sector data itself. Along with the sector address in the preamble, some special synchronization bytes are written; these are a unique sequence of bytes that appear at the head of each preamble, letting the disk controller know that it's about to read a sector address. And just to make the story complete, we should mention the gap bytes—filler bytes that are placed between sectors to create a timing tolerance for the reading of each sector.

Cyclical redundancy check

You may have heard it called the CRC. When a sector is written, a special *checksum* value, called the cyclical redundancy check (CRC), is calculated, based on the value of all the bytes written to that sector. This value (also known as a CRC) is written to a special location on the disk immediately following the sector data. When the sector is later read from the disk, its CRC bytes are also read. The same calculation that determined the CRC bytes that were written on the disk following the sector data is performed again, this time on the data that was just read. The CRC calculated from the data just read is compared to the CRC that was calculated and written to the disk. If the two values don't match, it means the data read is not exactly the same as the data that was written; that is, a read error has occurred.

Physical Formatting

Writing the sector addresses, sync bytes, gap bytes, and a few other miscellaneous chunks of data into the sector preamble is called *hard, physical,* or *low-level formatting,* because the job can be done only by hardware. During hard formatting, software in your Macintosh tells the disk device driver to format a track and specifies a few parameters; from then on, it's the job of the controller itself to execute the format.

The physical formatting must be done before any soft-sectored disk can be used for data storage. A second, separate process, called logical formatting (which we'll talk about in a minute), must also take place before a disk is ready to store data.

What's potentially confusing about the physical and logical formatting processes is the fact that the Erase Disk command in the Special menu of the Finder carries out both aspects of the job for floppy disks, but only the logical formatting for hard disks. When you format a floppy disk, the Erase Disk command first performs a physical (hard) format on the disk, followed by a logical format; when you format a hard disk, it skips the physical formatting. It does so, presumably, because most hard disks are sold already formatted and never need *physical* formatting again. Well, they usually never need physical formatting again. Let's look at a situation when one might want to reformat a hard disk physically.

Must You Interleave Me?

The major job of a hard format is to write the address of each sector into the preamble of sector data. You may have assumed that sectors are numbered sequentially around the track, and, in point of fact, many times they are. But there's no law that says they must be, and there are good reasons *not* to number sectors sequentially.

Suppose you have a computer whose performance is perfectly matched to your hard disk. As data comes flowing out of the disk controller, the computer always manages to jam the data into memory, getting back to the controller just in time to grab the next batch of data that's been read.

A lovely situation. But in real life, things seldom work out quite so nicely. Frequently, once a disk has moved to the track it

needs, it can start spitting out data faster than the computer can receive it. What happens is this: The controller reads a sector of data, and the computer stores it away. The computer turns back to the controller, ready for more data. But, by now, the next sequential sector is history; the third sequential sector is about to come skimming under the heads. Now it's the computer's turn to wait, while the disk makes nearly a full revolution and the beginning of sector 2 spins around again.

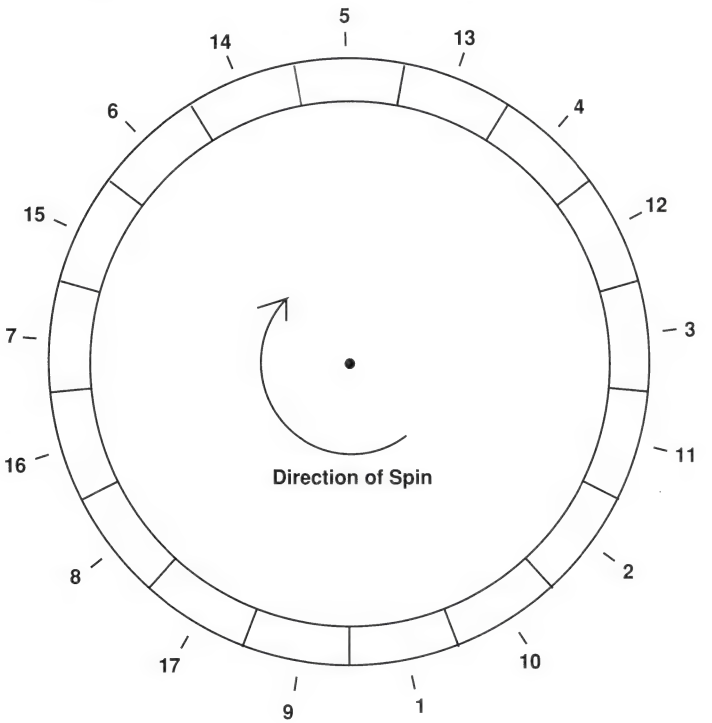
This is about the worst match possible, since it yields only a single sector of data for each revolution of the disk. So let's get tricky. Since the sector addresses are simply data—a special kind of data, but data nonetheless—we can change them. We'll just label every other sector sequentially around the track.

Proceeding around the track, we start with sector 1, then we skip a sector, then comes sector 2, skip a sector, then sector 3, and so on. When we get back to the beginning, sector 10 will be between sectors 1 and 2, sector 11 between 2 and 4, and so on to sector 9, which would be between sectors 17 and 1 (on a 17-sector disk). We've just changed the *interleave factor* from 1 to 2, and now when we read sequential sectors from the disk, we'll have twice as much time to process a sector before the next one comes flying by.

Instead of needing 17 revolutions to get all the data on a 17-sector track, we'll require just two revolutions with an interleave factor of two. That's not so good as getting the whole track read in a single revolution, but it's far better than what we had with the original one-to-one interleave. Changing the interleave factor is one way we can tune the performance of a hard disk to that of its host computer. But beware: as we've just seen (with the initial example of a disk with 1:1 interleave factor), when you lower the interleave factor to the point where the computer can no longer keep up with the disk, performance suddenly plummets. Changing the interleave factor—and other parameters set by physical formatting, such as sector size—is a delicate operation usually best left to the manufacturer.

Figure NDC-2

Interleaving



2:1 Interleave (17 sectors per track)

The Software

Getting Logical

So far, we've been dealing with physical characteristics of disk hardware—the number of tracks or cylinders per platter, the number of platters, the sector size in bytes, the number of sectors, the interleave factor, and so forth. These characteristics are either immutable elements of the hardware, as in the case of the number of platters, or factors set by the hardware according to instructions from a computer's operating system (and thereafter seldom altered). There is a whole other group of disk characteristics, however, that has to do with how the operating system organizes and finds data on the disk.

For speed and efficiency in accessing particular bytes out of a vast sea of 40,160 or more megabytes, it is clearly necessary for the operating system to construct some directories and indexes telling it what's where, which parts of the disk are spoken for, which parts are free, and even which parts should never be used because of physical damage. The way such information is organized on the disk is called the *logical format* of the disk, and the process of writing the various directories and indexes that support this organization is called *logical formatting.* As mentioned earlier, when you format a hard disk using the Finder's Erase Disk command, all you are really doing is a logical format; the physical format has already been done. With a floppy disk, on the other hand, the Erase Disk command first performs a physical format, then automatically follows with a logical format.

What's more, whereas the physics of disks and disk drives is the same no matter what computer we're talking about, the logical structure of disks is quite different. All Macintoshes (and most new IBM and compatible PCs) use 3 1/2-inch floppy disks. However, the information on these floppy disks is organized much differently on a PC disk than it is on a Macintosh disk. It takes a special disk drive, Apple's 3 1/2-inch FD/HD, to read IBM-formatted disks.

Since 1986, no matter what kind of disk we use—hard or floppy, fixed media or replaceable, 800K or 300 MB—the Macintosh's operating system always uses the same logical format, which

organizes the disk into five (possibly six) main areas: the boot blocks, the volume info blocks, the catalog tree, the extents tree, and the data area. The sixth potential area is the partitioning information. This applies only to hard disks that have been divided into multiple areas, each of which is treated as a separate disk.

Speaking Volumes

Just as *you* deal with the physical structure of a disk (it's a piece of plastic that you put into the drive slot), the computer's operating system deals with a disk's logical structure. There's a name for the logical disk that your computer deals with: it's called a *volume.*

As we mentioned in the preceding section, there can be more than one volume on a disk. A disk that has been *partitioned* into multiple volumes contains special bookkeeping information up front to let your Macintosh know how many volumes are on the disk, where each one is, how big it is, and so on. This type of information constitutes the first level of logical formatting. Disks that aren't partitioned—which means all floppy disks and a great deal of hard disks—don't have this information at all.

Whether it's a single floppy disk or a partition on a huge hard disk, a Macintosh volume contains all of the bookkeeping information mentioned earlier: boot blocks, volume info blocks, catalog and extents trees, and the data area. The format of this information has been precisely specified, and your Macintosh expects to find information of a very specific type at predetermined locations on the disk. If any of the information is missing, damaged, or presented in an unexpected way, your Macintosh can't deal with it. (Fortunately, this kind of damage, though common, is easy to repair. The Norton Disk Doctor can handle it automatically, with very little input from you.)

Let's take a tour of a Macintosh volume to see what kind of information is stored in its various parts. We'll start, as does your Macintosh, with the *boot blocks.*

The Boot Blocks

The *boot blocks* always occupy the first two sectors of a disk volume. The boot blocks do just what their name implies: they help your Macintosh pull itself up by its bootstraps, from empty-minded idiot to efficient manager, by providing information internal read-only memory (ROM) used to start your Macintosh.

Among other information, the boot blocks identify the filing system used on the disk (this tells your Macintosh how to locate documents and applications), the names of important system files, the maximum number of files that can be open at once, and so on. Also included are portions of a small program that first loads itself into your Macintosh's RAM and then loads critical parts of the operating system. This bootstrap code is stored in the second half of the boot blocks. The rest of the bootstrap code (indeed, the majority of it) is stored in ROM itself.

Volume Information Block

The *volume info block* contains critical information about the disk volume itself. In effect, it provides a brief "road map" to the rest of the volume, by indicating the locations of other critical bookkeeping information such as the catalog and extents trees. This area contains other information including the name and size of the volume, how much space on it is unoccupied, where the System Folder is, and so on.

Volume Bit Map

The next several sectors contain the *volume bit map*, which is a sort of "hotel register" showing which parts of the volume are occupied and which are free. You'll remember that, during physical formatting, a disk is divided into sectors of a specific length, depending on the disk. The logical equivalent of sector is *block*. A *block* is the minimum amount of disk storage that your Macintosh can deal with. Each block is equivalent to at least one sector, sometimes two or more.

A file, whether it's a document such as a letter to your Aunt Millie, an application such as the Norton Utilities for Macintosh, or a System file such as the Finder, occupies an integral (whole, not fractional) number of blocks on your disk. Thus, an 1100-

byte file will take up three 512-byte blocks on your disk, even though most of the last block is empty. You might think it would be more efficient to have smaller blocks, and hence less wasted space, but the increased overhead it would take to handle smaller blocks would slow everything down so much it wouldn't be worth it.

That unusable space at the end of a block is called slack *(space), and it's the reason files sometimes seem to shrink when you move them from a hard disk to a floppy and expand when you move them in the other direction. Different media can have different block sizes. For example:*

Hard Disk Capacity	**Block Size**
<20 MB	1 sector/block=512 bytes
20–60 MB	2 sectors/block=1K
60–100+ MB	3 sectors/block=1.5K

We accept the greater slack of larger block sizes in return for the better performance we get with them.

Returning to the volume bit map: Recall that on a modern computer all information is simply long strings of *1*s and *0*s. Each position in such a string is called a *bit*, and represents the smallest possible unit of data. In the volume bit map, each bit corresponds to one block in the data area of the volume, where files are actually stored. The first bit in the bit map corresponds to the first block in the data area, the second bit to the second block, and so on. When a bit is set to "1," the corresponding block is currently occupied by data belonging to a file. When the bit is set to "0," it is free to be assigned to another file. Thus, the volume bit map keeps track of which blocks are occupied and which are free. Your Macintosh uses this information to determine where to put new files and additional parts of existing files. Speaking of parts, this last item identifies a problem with storing information that we'd better examine at length.

Files in Flux

The basic problem with managing computer files is that they're constantly changing (of course, the ability to change computer files easily is also what makes them so attractive). But suppose

we have a file that's 2,250 bytes long, and we're writing it to a fresh 800K floppy disk. The smallest number of bytes that can be read or written from a disk is a single sector, and that is indeed the block size on an 800K floppy. We'll need 5 sectors (blocks) to hold our 2,250-byte file. The first four sectors will hold 2,048 bytes, which means we'll need only 202 bytes of the last sector. Since we can't write a partial sector, your Macintosh will reserve all of the fifth sector for the file, letting the remainder of the last sector go to waste. Our new file will occupy five contiguous (adjacent) sectors of the disk's file data area, after the bookkeeping information.

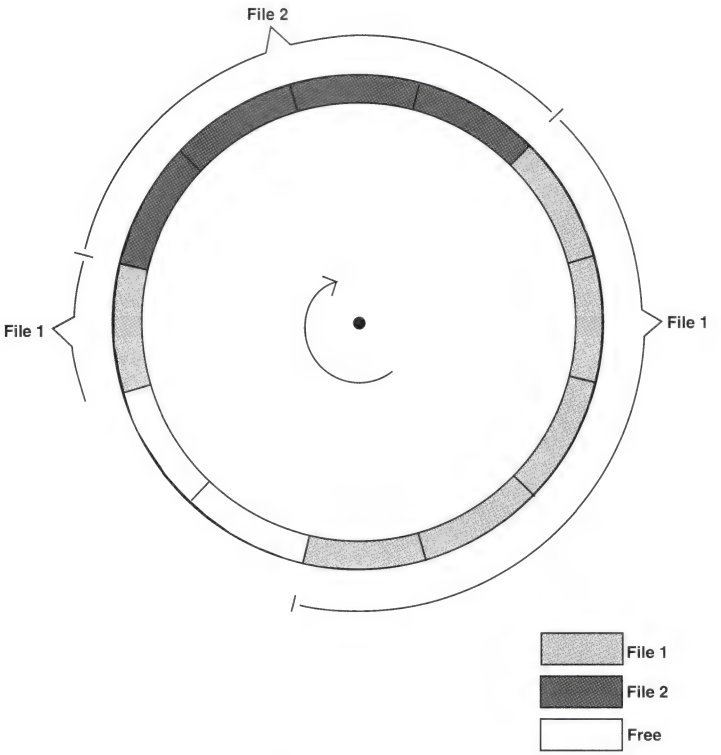
Now let's write a second file that's, say, seven sectors long. It will occupy the next seven sectors of the data area. Now comes the fun! Suppose we want to add 460 bytes to our first file. As you'll recall, only 202 bytes of the last 512-byte sector was in use, so we still have room for 310 bytes there. But that leaves 150 bytes (460 minus the 310 bytes we added at the end of the last sector); where shall we put them?

We can't simply put them in the first sector after our five-sector file, because that sector is already in use by the next file (the seven-sector file). We could move that next file up a sector, but that would take a while. And, besides, consider how inefficient it would be if the next megabyte of sectors were already taken by files. We'd have to move a megabyte of data just to write a lousy 150 bytes. Not a good solution.

The Extents Tree

A much better solution, the one that your Macintosh uses, is to allow files to be stored in pieces if necessary. Information about these file pieces, called *extents,* is kept in the *extents tree.* When your Macintosh needs to expand a file, it first checks the volume bit map to find the next free block. It then reserves it for our file. In the previous example, the first 5 + 7 sectors are taken, so the first free sector is located some 13 sectors from the beginning of the file data area. Our file now occupies the first five sectors of the file data area, plus the 13th sector. So our file is fragmented now; the beginning portion is stored in contiguous sectors at the beginning of the disk, while the ending portion is elsewhere. This is not a problem, however, provided we can figure out a way to link this ending piece of the file with the beginning piece, so that your Macintosh knows where to find everything.

Figure NDC-3
Fragmentation



For most files, this isn't too much of a problem, as the bookkeeping entry for each file can handle up to three pieces in either fork of the file (we'll explain *forks* in a bit). For files whose resource or data forks are fragmented into more than three pieces, however, additional help is needed to keep track of the file's data.

The extents tree stores this information. For each extent (piece) in a file, the tree keeps track of the file the extent belongs to, where the extent begins, and where it ends. The tree also records how many extents belong to a file.

By the way, the extents tree is called a tree—a b-tree to be precise—because of the way it's structured. Data is stored in nodes. *There are two types of nodes:* index *nodes and* leaf *nodes. Index nodes are used to locate information stored within*

the tree; leaf nodes are used to store the information itself. Nodes are stored in different levels, from the root onward. Within each level, nodes are linked to each other. This seemingly complicated structure is actually more efficient than a single long list. For one thing, information can be located much more quickly.

That's fine for files that happen to be fragmented. "But what about other files?" you might ask. "How exactly is their bookkeeping information cataloged?"

The Catalog Tree

So far, we've said that the Macintosh maintains a table close to the beginning of each disk called the volume bit map (VBM). We know that the VBM is used to keep track of which blocks are free, and which are in use and by which file. We also know that a block is simply a convenient grouping of one or more sectors, invented to cut down the amount of bookkeeping necessary to keep track of space use on a hard disk. We know that your Macintosh maintains a separate table, called the extents tree, to keep track of pieces belonging to heavily fragmented files. What we haven't examined so far is how your Macintosh keeps track of other, less-fragmented files.

Prior to 1986, the Macintosh stored information about files in a single long list. This Macintosh Filing System (MFS) had severe shortcomings. For one thing, it could only keep track of about 128 documents, applications, and folders. That wasn't too bad for floppy disks, but early hard disk users quickly found that having too many files would cause your Macintosh to "crash," risking data loss in the process.

When the Macintosh Plus was introduced in 1986, with its built-in SCSI port designed to commuicate with hard disks, Apple shipped a new filing system to go along with it. Called HFS (Hierarchical Filing System), the new filing system can, in principle, keep track of a limitless number of files and folders. What's more, it keeps the information in a form that's easier and faster for the Macintosh to search through. File locations are stored in the *catalog tree.*

The catalog tree is similar in form to the extents tree we talked about earlier. We'll discuss details on how the tree is structured and how your Macintosh uses it to locate files a little later, when

we look at the whole system in action. For the moment, suffice it to say that the catalog tree keeps track of all folders, documents, and applications on your disk. Among other information, it stores the beginning location of each file and its length. Because the numbering scheme used is a little different, it's worth pausing to take a look at it.

Ways of Counting

Back when we looked at the physical layout of a disk, we found that the disk controller refers to a particular location using a three-coordinate system: the side number, the track number, and the sector number. Since the hardware deals with disks in this three-coordinate system, it's necessary that, at some level, a computer be able to deal with the disk using the same system. For the operating system, however, this three-coordinate system is awkward, since the number of tracks, sectors, and sides all change from one disk to the next. Your Macintosh, therefore, locates data on a disk by a one-dimensional sector numbering scheme; numbering all the sectors sequentially, starting with sector 1 of side 0, track 0, proceeding through all the sectors on track 0, then on to the sectors on side 1, track 0. All the sectors in a cylinder are numbered first before the System moves on to the next cylinder; that minimizes head movement, and, therefore, access time, when sectors are read sequentially. The continuous sector-numbering scheme that your Macintosh (and many other computers) uses is called *logical sector numbering*; unlike physical sector numbers, which start at 1, logical sector numbers start at 0.

Don't be confused by the statement that your Macintosh numbers disk sectors sequentially—there's no physical formatting going on here, no addresses actually written on the disk. What's occurring is simply a translation between the way your Macintosh refers to a given sector and the way the disk hardware refers to it. Think of it as the difference between calling it "Sector One" in English and *Premier Secteur* in French.

Once we've got this sector-numbering scheme down pat, the block numbering scheme follows pretty quickly. First, we skip over all the sectors occupied by the boot blocks and the volume information block, including the volume bit map. These areas, which are always set up during logical formatting, are all consid-

ered part of the system area and are excluded from the block-numbering scheme. All the sectors beyond the system area, starting with the first sector after the volume bit map, are considered part of the data area and are included in the block-numbering scheme. On a typical hard disk with a block size of one sector, the first available block on the hard disk starts at sector 15; that's because the boot blocks, the volume info block, and the volume bit map all take up the first fourteen sectors. Thus, block 500 in the data area is equivalent to sector 515 on the hard disk.

Lest We Part

Strictly speaking, the preceding sketch of sector numbering is only true of disks that have not been partitioned into multiple volumes. Partitioning is a way of making your Macintosh's operating system treat a hard disk drive as if it were several drives in one. Each such volume has its own boot blocks, volume info block, volume bit map, and so on.

Now, a 60 MB hard disk has about 122,880 sectors. If we partition it into two 30 MB volumes, the second volume will begin at about sector 61,441. On this volume, block 500 in the data area is equivalent to block number 61,955 on the hard disk. (Of course, a 60 MB hard disk actually uses two-sector blocks, so that the data area really begins at 30,736; that is, 61,442/2+15=30,736.)

Back to the Catalog Tree

The catalog b-tree is the central repository of information about files on a disk, and as such is very important. Each file, whether it be a folder, a document, or an application, has a single entry within the catalog tree. This entry includes the file's name, the folder it is located in, its location on the desktop, and the location and length of the file's *data* and *resource forks*.

Which fork do I use?

Every file on a Macintosh has two forks. This is the Macintosh's way of keeping changeable data, such as the contents of a letter or a database, from permanent data, such as program code, the contents of dialog boxes, and other *resources*.

Resources are very important in the Macintosh scheme of things. For example, all of the text in dialog boxes is usually kept in resources, and not within the program code itself. This makes it easy to localize software for international markets. Without having to recompile the software, you can simply edit the text resources to match the target language.

All such resources, including icons, dialog boxes, program code, and the like are kept in a file's resource fork. Highly changeable data (such as the contents of a memo), if any, is kept in the data fork. Not all files have both forks: most, in fact, have only one. Documents usually have only a data fork, with a resource fork of zero length. Applications, on the other hand, generally have a resource fork and a zero-length data fork.

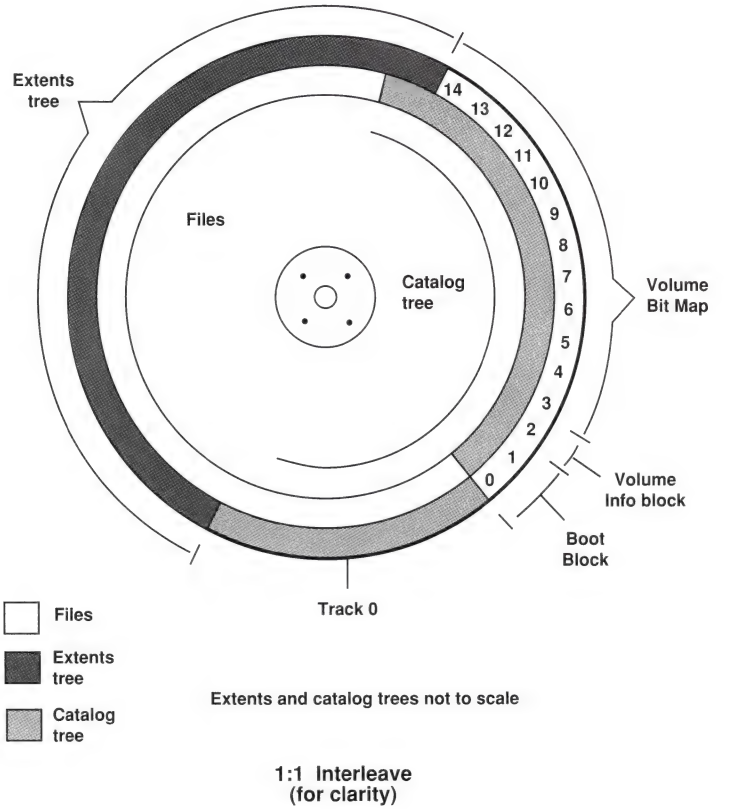
The Macintosh Hierarchical Filing System (HFS) keeps track of both forks of a file, including where each starts, how long it is, and where its pieces are stored. The first three pieces of each fork are tracked in the catalog b-tree. Other pieces (extents) are tracked in the extents b-tree.

Tying Up the Loose Ends

So far, we've been talking about two main areas the disk is divided into—the system area and the data area—and the subdivisions of the system area. Remember: the system area is divided into the boot blocks, the volume info block, and the volume bit map. The first part of the data area is taken up by the extents and catalog b-trees, which keep track of file fragments and of file locations, respectively. File data is stored after these areas. All of this is easier to understand if you look at it in action, which is what the next section is all about.

Figure NDC-4

The Well-Tempered Disk



How It All Works

The preceding discussion on the Hierarchical Filing System (HFS) is easiest to understand if you look at your Macintosh in action. That way, you can see how each element of the file system contributes to the process of creating and managing files.

Creating a File

Let's say you've fired up your trusty word processor and have begun to compose a memo to the boss. You're a cautious worker, so you choose to save your work frequently, remembering that a momentary loss of power or some other glitch can cause you to lose everything in RAM. Any work not previously written to a disk will then be lost for good.

The first time you choose Save..., a dialog box appears asking you to give the new document a name. You type in a name, say "Memo to Boss," and press the Return key. Now your Macintosh's file system goes to work, and quite a bit happens in the few seconds it takes to create and save the document on disk. Your Macintosh knows several things about the document that are of immediate interest: among them its name and the ID number of the folder it's in. These two pieces of data are all the information your Macintosh needs to locate a document. You've just typed the name of the new document. Your Macintosh already knows the ID number of the current folder, which is where the document will be put. (The ID number was assigned when the folder was first created. The volume info block keeps track of the next available ID number.) Your Macintosh uses this information to determine where to store the catalog entry for the new document. Since most applications need to be able to save documents, and it's important that they all do it in the same way, the Macintosh operating system (OS) takes care of the fine details. A set of OS routines called the File Manager (FM) handles all the dirty work. An application, when it wants to save a document, passes off control of the system to the File Manager ("Here, you do this!"), informing it of the document's name, directory ID number, and so on. The application also tells the FM where to find the document's data in RAM.

Checking for Room

First, of course, we ought to make certain there is enough room on the disk. This kind of information is stored in the volume info block, which we introduced earlier. The amount of free space on the chosen volume is compared with the amount of space that your application has requested for the new file. If there is enough, the FM reserves enough blocks to accommodate the file, plus a little slack at the end to help keep down future fragmentation. A number stored in the volume info block tells your Macintosh where to begin scanning the disk in order to find sufficient room. Once space has been found, those blocks are marked "in use" in the volume bit map. The document can now be copied from RAM to disk.

Doing the Books

Your Macintosh now needs to record where the document has been stored on your disk, so it can be found in the future. This information is stored mainly in the catalog b-tree. So that it may be found quickly, file information in the catalog b-tree has to be stored in an orderly manner. Although it seems complicated, the fundamental concepts are quite simple. Read the following discussion carefully and you should be able to see how it works.

We said earlier that the catalog tree is composed of nodes. These nodes are linked to each other. It is a b-tree because it is balanced: nodes to the left of a particular node refer to lower ID numbers, nodes to the right refer to higher ID numbers.

Now there are two main types of nodes: index nodes and leaf nodes. Index nodes are the signposts the Macintosh file system uses to find the file information stored in the leaf nodes. The index nodes point the way to the leaf nodes.

At the first level of the catalog tree is the root node. If the catalog tree represents a library of information about a disk—similar, say, to your public library downtown—then the root node may be thought of as the floorplan for the disk library.

Now, when you look for a book in a large library, the first thing you're supposed to do is to check the card catalog. The card catalog gives you a number (Library of Congress or Dewey Decimal, it doesn't matter) under which to find the book you

want, just as the Macintosh filing system provides each file with a name and ID number.

For purposes of this example, let's say the book number is 5025. Armed with this number and the book's title, we can find the book we want.

Suppose the library has eight floors of books. Obviously it would be very tedious to start at the first floor and begin searching through each stack. That would defeat the whole purpose of the card catalog. The library is organized in an orderly fashion, but the exact details vary from library to library. We need a guide, or series of guides, to help us find our book.

Most libraries publish a floorplan, which shows what books may be found on each floor. They don't tell you every single book number on every floor; searching through such a list would be quite as tedious as searching the shelves directly. Instead, the floorplan gives ranges of numbers. In this case, we'll say that the library guide shows that books numbered 0–999 are stored on the first floor, books numbered 1,000–1,999 are stored on the second, and so on.

The book we want is number 5,025. We guess from the pattern that it is stored on the sixth floor. Checking the floorplan, which says books numbered 5,000–5,999 are stored there, we find our guess was correct. So we catch an elevator to the sixth floor.

The root node of the catalog tree functions in exactly the same way. Its entries give ranges of file numbers. Each entry points the File Manager to a node at the next level. We may think of these next-level nodes as the "floor directories" of our library.

Now, rather than have us search through each section of the sixth floor, the library has published a guide to all the books on the floor; it's right outside the elevator. In this case, we'll say that books numbered 5,000–5,249 are in section one of the sixth floor, books 5,250–5,499 are in section two, and so on. Thus, the book we want is in section one. We'll walk over and check things out.

The nodes below the root node in the catalog tree, our so-called "floor directory nodes," are similar. After riding the "root-node elevator" to the correct next-level node, the File Manager compares the number it's using for the file it wishes to save with each entry in that node. When it finds a range that the file

number falls into, it transfers to the node pointed to by that entry. This next level of index nodes are equivalent to the section directories in the library.

Speaking of which, another sign located at the beginning of each section—the section directory just referred to—tells us which books are located in each stack. Books 5,000–5,049 are located in the first stack, so we search there.

Again, the third level of index nodes may be thought of as "stack directories." Note that each level of index nodes becomes increasingly specific: what floor, what section, what stack, and so on.

On Stack One is a shelf directory, telling us what book numbers are found on each shelf. This directory points us to the correct shelf—in this case, shelf three of the first stack of the first section on the sixth floor. By scanning the spines of the books on that shelf, we find the one with the correct name.

To summarize: we found our book by going to the card catalog and coming back with the book number and title. We used the book number to find out what floor of this eight-story library the book was stored on. On the appropriate floor, we discovered what section of that floor contained the book. A sign at the beginning of this section told us which stack to search. A sign on the stack told us which shelf to search. Thus, we zoomed in on the correct shelf, after which we used the book's title to find it, scanning the spines of each book on that shelf.

Bringing It Back Home

If you understand how to find a book in a library using the method described above, you know how the Macintosh Hierarchical Filing System works. The floorplan of our library is, as we said, the same as the root node of the catalog tree. The section, stack, and shelf directories are index nodes. The shelves themselves are leaf nodes (the final level of nodes in the tree); the individual records within each leaf node store file information and are equivalent to books in our example.

A smaller disk may have fewer levels of index nodes than are shown in this example.

So to find a file under HFS, the File Manager first looks at the root node of the catalog tree. The location of the root node is stored in the catalog tree header, which is itself referenced by the volume info block. The root node may contain up to eleven index records, each of which "points" to a unique node at the next level "up" from the root node. The FM compares the directory ID for the file it has been given with each index record.

On the hard disk being used to develop this example, there are actually four records in the index node of the catalog tree. The first covers file ID numbers 1–4,352; the second covers 4,353–4,674; the third, 4,675–5,659; and the last, all numbers from 5660 on up. Each record contains a directory ID range and a link. As we said, this link points to a unique index node on the next level.

Record number *x*	***means* go to index node *y***
Root node	*Root node*
Record 1 (directory ID numbers 1–4,352)	1st node, next level*
Record 2 (directory ID numbers 4,353–4,674)	2nd node, next level
Record 3 (directory ID numbers 4,675–5,659)	3rd node, next level
Record 4 (directory ID numbers 5,660–end)	4th node, next level

*"next level"=root + 1

Now, if we use the same directory ID number we used in the library example (5,025), it's clear that we need to examine the index node ("floor") pointed to by the Record 3, which covers directory ID numbers 4,675–5,659. This node (third node, second level) points to other nodes in the next level up. The FM again compares the directory ID it's been given with the ID ranges in each record of that node. A match sends it to the correct node in the third level.

By comparing the directory ID number with successive records in each index node to which we've been pointed, we can determine which record points to the correct node on the next

level, until we've found the leaf node that contains information about the document we want. The process of searching through the catalog b-tree to find a particular leaf node is called *parsing*.

Back to File Creation

When your Macintosh gets ready to store information about a new document, it first searches the catalog b-tree to find the leaf node associated with the folder in which the document is to be stored. It does this by comparing the folder's directory ID number with the numbers stored in each index record. It starts with the root node of the tree and is pointed to the appropriate index nodes at each successive level.

Once the correct leaf node has been located, HFS checks to make sure that the name you've chosen for your document hasn't been taken already. If not, all the appropriate information about the document—its size, where on the disk its resource and data forks are located, and so on—is stored in a leaf record in that leaf node.

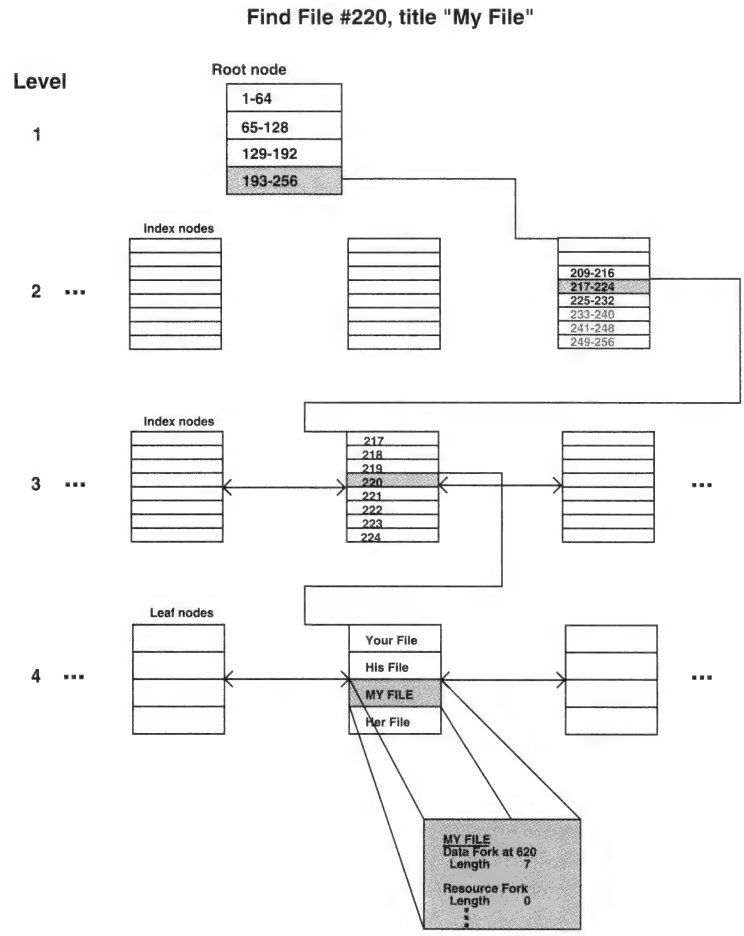
To summarize

1. When you save a new document on a disk, the application you're using passes on information—including the document's name, the directory ID number of its folder, its size—to the File Manager.
2. The File Manager checks the volume info block to find out where the next free space on the disk is located. When enough space is found, it is marked "reserved" in the volume bit map; the bits corresponding to each reserved block are changed from 0 to 1. The file data is written to the appropriate blocks on the disk.
3. The File Manager parses, or scans, the catalog b-tree to find the appropriate place to store the file's bookkeeping information. It uses the document's folder ID number to search up among the tree's index nodes, starting with the root node, whose location is known. The index nodes on the next-to-last (penultimate) level of the tree point to leaf nodes, which store the actual bookkeeping information.

4. When the correct leaf node is found, it is checked to make sure the file's name isn't taken already. If not, the file's bookkeeping information is stored in the leaf node. This information includes the file's name, the location of the first three pieces of the file's data fork, the first three pieces of its resource fork, and so forth. See the illustration later on to understand how it all works.

Figure NDC-5

Parsing the Catalog B-Tree



Of course, this discussion has been greatly simplified and is not presented in strictly the same order as the events that actually occur on your Macintosh. In practice, quite a bit more goes on behind the scenes, especially when you're working with disks that are nearly full. In such cases, the unused space on the disk is usually broken up, or fragmented, into many small pieces. When you save a new file on such a disk (presuming there's room for it), the File Manager may have to divide the file into pieces and store it more or less all over the disk. As stated earlier, these pieces are called extents, and extents in excess of three in each fork are tracked in the extents b-tree.

Opening and Changing a File

Naturally, the Macintosh file system goes through all these machinations quickly and efficiently, so that your documents can be located easily the next time you start your Macintosh and get to work. Think of how long it would take to find files if your Macintosh had to search through an entire hard disk; we're talking about minutes instead of microseconds.

Suppose you've already started your trusty word processor and you want to work on the document that we "created" in the previous example. You choose the Open... command from the File menu, find the correct filename in the scrolling list, select it, then press the Return key. What happens inside your Macintosh at this point?

As before, the File Manager is told the name and directory ID of the file you want to open. The File Manager then parses (searches through) the catalog b-tree, using the file's directory ID to find the correct leaf node and the file's name to find the correct leaf record in that node. When the File Manager has determined where the file is located on disk, it sets up a book-keeping area in RAM to keep track of the file; contents of this area include the file's location and other information. (This bookkeeping area is called a File Control Block, or FCB. A number within the Volume Info Block of the startup disk specifies how many of these FCBs—and, therefore, how many open files—the current setup can support.)

The file is marked "busy," meaning another application can't open it until your word processor has finished with it. The File Manager returns control to your word processor, informing it where in

RAM it has stored the file's bookkeeping info (the FCB). It's now up to your word processor to read some or all of the file's data into RAM and to display it in a form you can work with.

You've Changed

You expand your memo to the boss into a full-blown report. Now you want to save your work. Where is the new information that you've added stored?

It depends on the condition of your disk, really. When you create a file, your Macintosh reserves a little bit (byte?) more space than it really needs. The file can grow into this space later if it needs to. However, if you add more than a 1,000 characters or so to a file, the reserved space will fill up. If you need more room, the File Manager will have to go looking for it.

In all likelihood, the next available free space won't be at the end of the file, but someplace else on the disk. So the FM must locate the next free area of sufficient size, write the information there, then record the location of the piece of the file it just created. The file is now fragmented. Remember that the catalog tree can track up to six pieces for each file: three for the resource fork and three for the data fork. If the file is more severely fragmented than that, the extra pieces (also known as extents) are recorded in the extents tree.

Deleting a File

The report didn't go over very well, and you'd just as soon never look at it again. So you drag its icon to the Trash and empty it. What now?

Curiously enough, the file's data isn't touched. There's no need. Instead, the File Manager parses the catalog tree to find where the file was stored, marks those blocks "available" in the volume bit map (changing *1*s to *0*s), then erases the file's leaf record from the appropriate leaf node in the catalog tree.

So if you change your mind about the file you just deleted (say, because the boss's boss saw it, liked it, and wants a fresh copy printed on letterhead stationery), you don't have to throw your hands up in despair and retype the whole stinking mess. Your report data is still there (presuming, of course, that the space hasn't been given up to another document. If you've done

nothing else since deleting the file, the data is definitely still there). It's simply a question of finding the data and restoring it. But that's another story.

You Are Here

Now you know quite a bit about how your Macintosh stores and works with files. You know the layout of Macintosh disks and what each area is used for. You've seen these areas in action creating, opening, changing, and deleting files. Seems simple, almost bullet-proof, don't it? If only that were true. In the next section, we discuss a few reasons why it ain't necessarily so.

Things That Go Bump in the Disk

Now that we know how a disk should work, we are in a pretty good position to understand the kinds of things that can go wrong—and more importantly—how to avoid or fix them.

Starting with the boot blocks (which is what your Macintosh does), we don't have to look far to see sources of potential trouble. When your Macintosh checks the boot blocks, it expects to find information of a particular type in a very specific format. It hates surprises. So if something unexpected is found, even if it's only one character off, your Macintosh can refuse to start up with the affected disk.

With the volume bit map, it's also pretty easy to imagine some of the things than can go awry. It's possible, for example, for a block in the VBM to be marked as "in use" yet not be part of any file currently recorded in the catalog b-tree. This may just be an error (an accidentally flipped bit), or it could signal a lost file. On the other hand, a block might be marked "available" in the VBM yet in fact belong to an existing file. If this error isn't detected and corrected (because the file is never opened in the meantime), the File Manager may assign the block to another file, thinking it's available. Thus, two files end up thinking the same block belongs to them both, a mistake referred to as *cross-linked files*.

Problems with the catalog b-tree can also render a disk inaccessible. For example, if the catalog tree header (the first block in the tree) is damaged, your Macintosh may not be able to find the root node in the catalog tree. The location of the root node (that is, which block it's in) is stored in the header, and because of the way the tree is actually stored on disk, it's impossible to say which of the 330 or so blocks in the tree holds the root node. It could literally be any one of them. If it can't find the root node of the catalog tree, your Macintosh can't locate files. Your Macintosh will refuse to mount, or display, such a disk. It may even tell you it's damaged, and ask if you want to initialize it!

Errors such as these can happen either when the moon is full and strange creatures roam the night, when the local power company sends a "spike" your way (a temporary surge in power that can cause bad data to be written to your disk), when you turn off your Macintosh while an application still has files open or, worse yet, is actually writing to your disk.

You can avoid a great many of these errors if you follow these precautions: always close your documents before you quit working. Be sure to save your work. Quit your applications before shutting down. Most important, always choose the Shut Down command before switching off your Macintosh. This command updates vital bookkeeping information.

In any case, the Norton Disk Doctor can spot, report, and fix logical errors such as the aforementioned, all with a minimum of effort on your part. In this way, it's far superior to Apple's Disk First Aid application program that comes with your Macintosh's system software.

In a way, the Norton Disk Doctor represents a translation of the knowledge we've gained in these pages into a very powerful application. The Norton Disk Doctor is designed to give even a relatively novice user the power to correct a variety of problems with a minimum of effort. Yet, even though you may not need to know much about how your disks work in order to keep them in top shape, a little inside information (like this stuff!) never hurt anybody. Except maybe a few unlucky souls on Wall Street.

Conclusion

If you've come this far, you should have a pretty good understanding of what's going on behind that disk light on your Macintosh. We haven't discussed everything there is to know about disks, of course, but we have covered all the important concepts and terms you're likely to run into in your day-to-day dealings with your Macintosh and its operating system. If you should decide to test out some of the material you've learned, poke about your disk (using the Norton Disk Editor), or maybe even discover a few items we didn't have space to mention here. We hope you'll discover that the Norton Utilities for Macintosh are as much fun for exploring your disk as they are useful for recovering data.

APPENDIX

A

About Norton Utilities for Macintosh

This chapter has three parts. The first explains what's new to this version of Norton Utilities for Macintosh. The second lists each part of the Norton Utilities in alphabetical order, and explains a little about them all. The third explains system requirements, and how to interact with the Norton Utilities.

Contents

A-3 What's New in Version 2.0

A-4 General Information about Norton Utilities for Macintosh

A-4 About each utility

A-7 Operating the Utilities

A-7 Mouse and Keyboard Usage

What's New in Version 2.0

This version of Norton Utilities for Macintosh contains a number of new utilities. We've also improved and expanded many of the tried-and-true parts of previous versions.

Here are just a few of the new features you'll find within Version 2.0:

- The new **Norton Backup** adds an extra level of data protection.
- **Directory Assistance II** has been greatly improved and expanded from the original Directory Assistance. It has powerful features that let you quickly locate and work with your favorite files and folders, even when they're stored in widely separate locations.
- Copying and formatting floppy disks is much easier using **Floppier**. Its special design takes advantage of both system and hard disk memory to minimize disk swaps when you're using a single-floppy drive system.
- **Norton Encrypt** lets you protect your sensitive data from prying eyes. Using a password that you supply, Encrypt scrambles your files so that their contents become undecypherable to those who don't have the password.
- You can now also protect data that you no longer need from falling into the wrong hands using **Wipe Info**. Wipe Info completely erases files and disks, and even the unused (free) space on disks, making deleted files completely unrecoverable. Even Norton Utilities for Macintosh can't get data back once it's been wiped with WipeInfo.
- Divide your hard disks into partitions and manage them using the **Norton Partition** desk accessory. You can even password-protect your partitions, to keep them safe from snoops.
- **Norton Disk Doctor**, **UnErase**, **Norton Disk Editor**, and **Volume Recover** (formerly Format Recover) have all been improved to take advantage of Volume Information Files. These files represent "snapshots" of your disks, and can be of great use in the event of disk damage.

- The **FileSaver** control panel has been improved. Easier to use but still flexible, FileSaver now lets you update your disk-protection information at will using command keys, and it will also update disk information automatically at specified intervals, without getting in your way.
- Using the **Fast Find** desk accessory, you can now copy data from files to the clipboard without having to open them. System 7 users can create and modify custom icons for files.
- **Speed Disk** now defragments files on your startup disk, without having to start from another disk.

General Information about Norton Utilities for Macintosh

Norton Utilities for Macintosh consist of an installation program, an on-line help file, seven application programs (Norton Utilities®, Norton Backup, Speed Disk™, Norton Encrypt, Floppier, Wipe Info, and Layout Plus), three desk accessories (KeyFinder, Norton Partition, and Fast Find), two Control Panel devices (FileSaver and DiskLight™), and one startup document (Directory Assistance™ II). Partition and Backup also have supporting system extensions.

Norton Disk Doctor, UnErase, Volume Recover, Norton Disk Editor, Speed Disk, Norton Backup, and Layout Plus can all be accessed from the Norton Utilities Main Menu screen, which appears when you start the Norton Utilities application. When installed, KeyFinder, Norton Partition, and Fast Find can be accessed from your Apple (desk accessory) menu. DiskLight and FileSaver are accessed via the Control Panel, which can also be found in the Apple menu. Directory Assistance II is a startup document and has no independent operation as such: it modifies the appearance and functionality of the Save, Save As, and Open dialog boxes used by almost all Macintosh applications.

About each utility

Directory Assistance II

Directory Assistance II, a system extension, adds power and flexibility to the Save, Save As, and Open dialog boxes used by

almost every Macintosh application program on the market. You can work with favorite files, create folders, delete files, search your disk, and change the way files are displayed, all without leaving the dialog box.

DiskLight

DiskLight monitors activity on hard disks and floppies to let you know what's going on during those long loads and saves.

Fast Find

The Fast Find desk accessory is not only more powerful and flexible than anyone else's, it's also faster. You can search an entire 40MBhard disk in less than five seconds. What's more, you can open documents and start applications directly from Fast Find; no more digging through your folders looking for documents.

Floppier

An application that makes it easier to copy and format floppy disks.

FileSaver

A control panel device that works to protect your hard disk from accidental formatting and from severe directory damage.

KeyFinder

Shows you every character of a selected font in a convenient table. Click a character to see what key combination you need to get it. KeyFinder makes it much easier to type arcane symbols and international characters.

Layout Plus

Lets you customize the Finder: choose a special font for text, set icon spacing and icon colors, and more. Does not work with System 7, which incorporates most of thesefeatures anyway.

Norton Disk Doctor

An absolutely unbeatable disk diagnosis and recovery tool. The Disk Doctor can fix problems that render disks unbootable and files inaccessible. In all, Norton Disk Doctor can diagnose and

repair over 45 different types of disk and file errors. And you don't even need to know anything about Macintosh disks to use it.

Norton Disk Editor

Gives the technically inclined a deep look into disks. You can examine and manipulate your directory structure, file attributes, and more. View all your files (including hidden files), search your disk for lost data, and repair damaged files. Norton Disk Editor shows you how each sector on your disk is used and explains its nuances via screen messages.

Norton Encrypt

The Encrypt application protects files from unauthorized access. File data is scrambled using a password that you supply.

Norton Partition

A desk accessory which enables you to create and manage soft partitions on your hard disks.

Speed Disk

Extended use of your Macintosh, especially lots of modifications to lots of files, can leave your disk looking like spaghetti, with pieces of files everywhere. This slows down operation considerably. Speed Disk fixes this problem by defragmenting files, consolidating the free space on your disk, and organizing files on your disk more effectively.

UnErase

The Peter Norton name is synonymous with data recovery. The UnErase® feature, designed specifically for the Macintosh, recovers more lost files, and recovers them more completely, than any other product. You have at your disposal three levels of UnErase: Quick UnErase®, UnErase by file type (lets you recover all GreatWorks 2.0 documents, for example, and many, many more), and text-search UnErase.

Volume Recover

Recover rescues formatted disks in a mere fraction of the time it takes other programs. You're up and running again in minutes instead of hours.

Wipe Info

Completely and permanently erases selected files and disks. Can also be used to wipe clean the free space on disks, rendering deleted files absolutely unrecoverable.

Operating the Utilities

To use Norton Utilities for Macintosh, you should be using one of the following system versions: 6.0.4 , 6.0.5, 6.0.6, 6.0.7, 7.0.0, or 7.0.1. The Utilities will run on everything from a Macintosh Plus to a Macintosh Quadra 900, although Quadra users may need to disable instruction caching. You must have a minimum of one megabyte of RAM for System 6 and two megabytes for System 7. Norton Backup requires an additional megabyte of RAM in order to run. For optimum performance we recommend more than the minimum amount of RAM. A hard disk drive is strongly recommended but not required.

Mouse and Keyboard Usage

Norton Utilities for Macintosh follow Apple's user interface guidelines. This means you can expect them to work as most other Macintosh programs work. We've also added some special features and functions. These are described below.

Keyboard Shortcuts

You can use command-key shortcuts to select buttons in a dialog box. For example, if a button is labeled "Drive", you can type Command-D instead of clicking the **Drive** button. Radio buttons and checkboxes may also have keyboard shortcuts, as do 3-D buttons and standard buttons.

Return and Enter always select the default button, and Esc always selects the **Cancel** button.

If a dialog box has only one button (i.e., an alert box), Enter, Return, or Esc will select that button and close the dialog box.

If a dialog box has neither text fields (places where you type in information, such as the name of a document) nor a scrollable list (of document names, for example), then holding down the Command key is unnecessary for the keyboard shortcut to work;

i.e., "O" by itself will select the **OK** button in addition to Command-O.

Anytime a keyboard shortcut closes a dialog, the selected button will flash briefly to notify you which button was chosen.

Radio Buttons

In dialog boxes whose only function is to choose one of a number of items from a set of radio buttons, double-clicking a radio button will select that radio button and accept the dialog box, as if you'd clicked OK.

As with keyboard shortcut s, double-clicking a radio button to close a dialog box will also flash the OK button.

If there is a single set of radio buttons in a window or dialog box, and there are no lists or text edit fields, then the up and down arrow keys may be used to change which radio button is selected.

Scrollable Lists

If a list is sorted alphabetically, you may type the initial character(s) in an item's name to select that item. (This feature works only if the list is sorted alphabetically. If the list is not sorted alphabetically, then an exact-match search is used instead of a closest-match search. If the list has several columns, only the first column is searched.)

Shift-clicking in lists (where applicable) uses the Finder's metaphor for selecting multiple items. That is, with the Shift key held down, you can click to select or deselect each item individually. You can also Shift-drag to select multiple adjacent objects.

Changing Drives

Within dialog boxes, clicking the drive icon is the same as clicking the Drive button. Also, the Tab key can be used in place of clicking the Drive button in dialog boxes.

APPENDIX

B Troubleshooting Guide

You should read Chapter 1, "Diagnosing Problems," before you use this appendix. Chapter 1 will help you determine the source of your problems and will tell you which part of this appendix you should read.

This appendix covers some of the things that you can do—beyond using the Norton Utilities—to try to fix your Macintosh.

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B-3 First things first
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B-14 Macintosh main logic board
B-15 Preventing problems

Things you may need

Locate the following items to assist you in the repair of your damaged volume:

- **The Norton Utilities Emergency Disk**
  (If you are not sure of which Emergency Disk to use, see Chapter 2, "Disk Repair and File Recovery.")
- **The Apple System Tools or System Startup Disk.**

For System 7, use the Disk Tools floppy disk.

- **The application that was used to prepare or "format" your hard disk for use on a Macintosh.**
  These types of applications are called "SCSI formatters" or "SCSI disk initializers."

  In most cases, this will be Apple's HD SC Setup application. If you are using a System 6.0x revision of Apple's System Software, this application is located on the Utilities 1 floppy disk. If you are using System 6.07 on high-density disks, it is located on the System Startup disk.

If you are using a System 7.0x revision, the Apple HD SC Setup application is located on the Disk Tools floppy disk.

  If a dealer originally formatted your hard disk and did not give you a copy of the application, you may have to locate a copy.

First things first

Before you do anything, try the following suggestions. Many problems start out small and actually become bigger the more they are worked on! Take a few minutes and try the easy things first.

Isolate the problem

Often, problems are easier to find and fix if you can first isolate them from your working equipment.

In other words, if you are using more than one hard disk and only one hard disk has a problem (which is usually the case), reconfigure so just the problem drive and your Macintosh are set up for the troubleshooting session. This will not only save time, but also prevent accidents from happening to trouble-free equipment.

Check all cables

It may be that your Macintosh or the hard disk is not getting power, or that they are not properly communicating with each other due to a faulty cable connection.

1 With the power switched off, check all cables and connections.

Make sure that your Macintosh and its peripherals are plugged into a grounded electrical outlet, as well as connected to each other. If the Macintosh is too close to a wall, the cable connectors may be loose or the cables may be crimped and the connection is not properly made.

If you are using a device that has a cable with the same type of connectors on each end, it may make a difference as to which end is connected to your Macintosh.

Do not substitute cables for different types of devices even if they look exactly alike. The wiring inside of the cable may be different.

2 If the computer doesn't start, check the power strip or wall outlet with an item that is known to work.

A lamp or small radio is a convenient tool for checking the power.

3 When you are certain that you have power available and all connections are snug, turn the system back on again.

If your Macintosh does not even begin to start up, you may have a hardware problem. Continue reading.

High-density disk initialized as an 800K disk

When a floppy disk is initialized incorrectly, it may still work with the floppy drive that initialized it. For example, your colleague gives you the latest copy of her spreadsheet on a high-density 1.4MB floppy disk. You insert the disk in your drive and you see the message, "This disk has been improperly formatted for use in this drive. Do you want to initialize it?" You bring the disk back to your colleague, she pops it into the floppy drive of her Mac Plus and the disk appears on the desktop. What is happening?

The Mac Plus has an 800K floppy drive. The 800K drive doesn't recognize that the floppy disk is a high-density disk and has formatted it as an 800K disk. When you put the disk into your high-density floppy drive, it recognizes the disk as a high-density disk, but doesn't recognize the way that the disk is initialized. If you are desperate to read the disk, you can put a piece of tape over the hole in the corner of the disk. (Not the write-protect hole, the other hole.) This will fool your drive into thinking that the disk is really an 800K disk.

After you get the data off, don't continue using the disk. The longer you use it, the greater the chance that the tape to come off in your drive and will cause even bigger problems. You can try to reinitialize the disk, but it probably won't format correctly. If it doesn't work, throw it away.

Have you added anything new lately?

The two top contenders for taking a startup drive temporarily out of service are adding a new SCSI device and installing software that modifies your system software.

If your problem occurred right after adding a hard disk or other SCSI peripheral device, check for SCSI device conflicts or termination problems.

If your problem occurred after adding new software, refer to the software's documentation to see if any programs called INITs or CDEVs (in System 6); or system extensions or control panels (in System 7) were installed. (For simplicity, this appendix will refer

to this category of software as INITs.) These types of programs are designed to enhance your system software, but they sometimes cause conflicts with your system files, other INITs or with a specific application. If so, you need to check for INIT conflicts.

SCSI device conflicts

The Macintosh locates and communicates with SCSI devices—such as hard disks, scanners, and CD-ROM players—by using a SCSI ID number. The SCSI devices are connected to each other, creating a chain through which the Macintosh can communicate with any device. Each device must have a unique ID from 0 (the last device in the chain) to 6 (the first device in the chain). Your Macintosh is always device number 7 and the internal hard disk is usually 0. Most external hard disks and other SCSI devices have a switch on the back with which you set the ID number.

› **To resolve SCSI device ID conflicts:**

- **Check each SCSI device to make certain that it has a unique ID number between 0 and 6.** If two numbers are the same, reset one device to an unused number and restart.

SCSI termination problems

A terminator is a small piece of hardware that fits over the SCSI port, connects to a cable, or is part of the electronics of your SCSI device. If the SCSI chain is terminated improperly, it can hang up your computer and cause startup problems.

Rules of the game:

1. If you have more than one SCSI device, you must be terminated twice—at the beginning and end of the chain.
2. There can be no more than two terminators in a SCSI chain.

If you have an internal SCSI hard disk, chances are that it is terminated automatically. The user guide that came with the hard disk will normally contain information on how to change its SCSI ID and how to enable or disable termination.

› **To resolve a SCSI termination problem:**

- **Check to see that the first and last device in the SCSI chain are terminated and the others are not.**

PowerBook and Quadra computers have special termination requirements. See the manuals that come with these comptuters for more information.

INIT conflicts

An INIT, short for "initialization program," is a utility program that, upon startup, alters the way that your system software works. (This can include some Cdevs or control panels.) Under System 6, the INIT is placed in your system folder, and the next time you start up, the INIT is read into the System. Under System 7, these programs are called system extensions and they are stored in the Extensions folder in the System Folder.

An INIT can cause a conflict with your system files, other INITs or with a specific application.

› **To resolve an INIT conflict:**

1 **Insert the System Tools disk in the internal floppy disk drive and turn on your Macintosh.**
This disk is supplied with your Macintosh. Your hard disk will appear under the System Tools disk icon on the desktop.

OR

Hold down the Shift key while you start up your Macintosh.
This will disable all extensions until you restart your Macintosh.

2 **Open the System Folder on your hard disk and remove the INIT or system extension most recently added to your System Folder.**

You will have to look in the Control Panels folder and Extensions folder.

3 Restart your Macintosh.
If startup is normal, you have found the problem. Refer to the manual that came with that program for information on resolving the conflict.

4 If the problem persists, remove all INITs from the startup System Folder and place them in a temporary folder.

5 Restart the Macintosh.
If startup is normal, move the INITs back into the System folder one by one, restarting each time until you find the culprit.

Troubleshooting Procedures

After you have eliminated the more common sources of problems, you should begin serious troubleshooting procedures. The following procedures explain the typical things that an experienced technician might try, in the order he or she might try them. If your problems are simple, you won't have to go beyond procedure 1.

1 Run Norton Disk Doctor

Norton Disk Doctor is the first thing you should try. For details on using Norton Disk Doctor, see Chapter 2, "Disk Repair and File Recovery."

2 Zapping PRAM (Resetting Parameter RAM)

Although this procedure sounds dangerous, it is really not scary or difficult. The PRAM (Parameter RAM) is an area of RAM that is used to store information about your Macintosh. Part of the information stored by PRAM is needed by your Macintosh in order to locate the current startup device.

Because this information is needed each time you use your Macintosh, it is stored even when your Macintosh is turned off (a battery is activated when you "Shut down" your Macintosh). If the information in PRAM becomes corrupted you can clear or "zap" this information and replace it with new information.

› **To reset PRAM:**

1 **Restart your Macintosh using the System Tools disk or System Startup disk which came with your computer.**

2 **Open the Control Panel by selecting it from the Apple menu, while holding down the Option, Command, and Shift keys.**
A dialog will appear warning that you are about to zap the PRAM.

3 **Click Yes.**
When the control panel appears, close it.

4 **Choose Restart from the Special menu.**
All of the Control Panel settings, except date and time, are returned to their defaults so you will have to adjust your settings.

OR

1 **Restart your computer while holding the Command, Option, p, and r keys down.**

2 **The computer will restart itself during this process. Release the keys and the system should start up.**

3 Replacing a damaged SCSI disk driver

Replacing a SCSI disk driver is potentially dangerous because if it is done incorrectly, it will format your startup disk. The procedure described next is an outline of the most typical steps for replacing a SCSI driver. The exact procedure varies with each disk drive manufacturer, so you should refer to the user's guide that came with your hard disk for detailed instructions on how to update your SCSI device driver.

1 **Start your Macintosh using the disk containing the setup utility that was used to format your hard disk.**

2 **Open the utility application.**

3 **After locating your volume, look for a button or feature named "Update" or "Replace Driver."**
In the Apple HD SC Setup application this button is named "Update."

4 **If an update or replace driver feature exists in the utility, select it only after you are certain of the following things:**
- The correct volume has been chosen for the driver update.
- Updating the driver will not cause the volume to be reformatted or initialized.

5 **If you have successfully completed updating the driver, restart your Macintosh.**
To ensure that no other problems exist, you should run Norton Disk Doctor.

4 Replacing damaged system files

This procedure will erase any special fonts or desk accessories that you have installed in the damaged system file.

1 **Restart your Macintosh using the system disk which came with your computer.**
The name of the disk varies with the system and type of drive you are using:

System Tools: System 6.x, low-density disks.

System Startup: System 6.07 or 6.08, high-density disks Software.

Disk Tools: System 7.

Always lock your Apple system disks to prevent accidental damage to the disks.

If your startup disk is a floppy disk and you only have one floppy disk drive, you must eject the system disk and insert your startup disk before you can see if the system files are damaged.

If your drive icon appears on the desktop underneath the system disk icon, your System and Finder files are probably damaged and will need to be replaced.

2 To replace the damaged System and Finder files:

- The correct volume has been chosen for the driver update.
- Locate and open the System Folder on your startup disk.
- Select and drag the damaged System and Finder icons from your startup disk to the trash.
- Choose Shut down from the Special menu.
- Start up with your Apple System Software Installer disk.
- Install the system software on your startup disk using the installer script for your Macintosh.

5 Rebuilding the Desktop

The Desktop file is an invisible file on each volume that helps keep track of the files on that volume. As you work with the volume, information is added to the file. If this file is damaged it can cause startup problems. It is a good practice to rebuild the desktop every month or so.

Rebuilding the desktop causes any Finder comments to erased. If FileSaver information has been saved before you rebuild the desktop, you can use the Norton Utilities to restore the Finder Comments after the desktop has been rebuilt.

1 Restart your Macintosh while you hold down the Command and Option keys.
A dialog box will appear asking you if you're sure you want to rebuild the desktop file on your disk.

2 Click OK.
Your volume should appear on the desktop shortly.

6 Recovering data from a damaged disk

If you are still unable to start your Macintosh using your startup disk, you may have a hardware problem that only a qualified service technician can fix. It may still be possible to recover files from the volume even though you may not be able to start up from it. See "Using Volume Recover" in Chapter 2, "Disk Repair and File Recovery."

7 Reformatting your hard disk

A hard disk can accumulate bad or weak sectors, which are known collectively as "bad blocks." When this happens, some sectors can no longer be accessed unless the hard disk is "physically reformatted" or low-level formatted. This procedure should only be used if you have exhausted all repair options. Because reformatting the hard disk will destroy all existing information contained on the disk, you must recover (using repair procedure 6) as much information as possible from your damaged volume before you begin reformatting. If you have a recent backup, you only need to recover new files and files that have changed since the last backup.

Almost all hard disk formatting applications deal with bad blocks differently. Some manage to remap the blocks using "spare" or unused sectors during the format process while others have a special procedure which needs to be run before or after formatting. Before you begin this procedure, take a minute to locate and review the documentation that came with the formatting software.

Do not format your hard disk unless you have a backup of the damaged hard drive or have successfully recovered all of the files using Volume Recover.

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1 **Locate the hard disk formatting software and users guide that came with the hard disk .**
See "Things you will need," earlier in this appendix, for more details.

2 **Find the chapter or section which explains the procedure for locating, disposing of or remapping bad blocks.**
Use the manual that came with your SCSI software.

3 **Follow the procedures contained in the SCSI software manual.**

4 **If you have a complete backup of your disk, you can restore the backup to the hard disk.**
Make sure that you've given your hard disk the same name as it had before reformatting.

If your system files were damaged, you may need to install the system software before copying the recovered information back to the disk.

Is it a hardware problem?

Your Macintosh is probably one of the most reliable computer systems manufactured today. It's not unusual for a Macintosh to go five years and even beyond without hardware failure. However, in the unlikely event you do experience such problems, we have provided a list of things that can go wrong that utility software can't fix. If you encounter one of these problems, you most likely will need to see a qualified technician.

Hard Disks

If you are having a problem with your hard disk drive which our software can't fix, chances are you may be experiencing a hardware problem. Most hard disks internal or external will outwardly display some telltale symptoms when suffering from a problem.

Internal and external drives

- The access or "busy" LED may have suddenly stopped working or may be flashing repeatedly.
- The sound the hard disk makes when it spins up and recalibrates may have changed or gone away.

What happened?

Some drives experience a problem known as stiction. This is where the read/write assembly gets stuck to the point that the platter no longer spins. If the drive is external, sometimes a gentle "thump" can free it up long enough for you to perform a back up. This procedure is not entirely recommended nor is it a long term solution, for as soon as you turn off the drive, the problem will return.

External drives only

The power LED or the light that indicates the hard disk is on doesn't light up.

What happened?

Sometimes, the power supply which powers the hard disk can burn out. This may mean that your data is still it intact on the drive itself. Have a technician investigate. This can save time and money.

Floppy disk drives

Macintosh floppy disk drives can become dirty to the point that they will no longer recognize an inserted floppy disk. If you experience this problem, ask your technician if your drive can be cleaned. We don't recommend off the shelf drive cleaning kits, for they are not a complete solution to this problem. Proper cleaning of a disk drive will not solve all floppy drive problems but is a good place to start. If a floppy happens to get stuck in a drive, take great care in removing it. The read/write head assembly is very delicate and most damage suffered here is not covered under Apple's warranty plan.

Macintosh power supply/analog board

The Macintosh 128K, 512K, 512Ke, Plus, SE, SE30, Classic and Classic II all contain a board which supplies power and video signals to the screen or CRT. If this board fails, the following symptoms can be observed:

- No bong, black screen
- Bong, black screen
- White vertical line in the middle of the CRT
- Chirping sounds

Macintosh main logic board

Some "sad Macintosh" codes (those containing an "F" within the first eight characters) can be rectified using the Norton Utilities for Macintosh. Those which cannot usually indicate that a problem exists with ROM, RAM or elsewhere on the main logic board.

Preventing problems

Although it is impossible to avoid problems entirely, there are quite a few things you can do to reduce problems with your Macintosh computer system.

Protecting hardware:

1 **Don't cover the cooling vent on your computer equipment.**
Don't cover, obstruct, or inhibit the cooling vents on your Macintosh or peripheral equipment. If the vents are blocked, the hardware inside your equipment could literally burn up.

2 **Never plug or unplug peripheral equipment to your Macintosh while it is running.**
Always turn off the power to your Macintosh system before adding, subtracting, or moving equipment to or from your current system setup. Take the time to do it right!

3 **Always double check SCSI device numbers and termination before installing.**
The manuals that come with your hardware should tell you how to find out this information.

Using your Macintosh:

1 **Always choose Shutdown from the Special menu to turn off your Macintosh.**
Don't just turn switch off the power.

2 **Don't keep several copies of system folders or different revisions of the System file on the startup disk.**
When copying from someone else's disk, make sure that you don't copy their system folder.

3 **Keep the size of your System file minimal.**

4 **Back up frequently.**
Even if you choose not to perform regular backups, you should at least make copies of your critical data files.

5 Run Norton Disk Doctor regularly.
In addition, you should also run Norton Disk Doctor whenever your Macintosh shuts down unnaturally, such as after a System crash.

6 Rebuild the desktop file every month or so.
See "5 Rebuilding the Desktop," earlier in this appendix, for more information.

7 Run Speed Disk every 90 days or so.
If you add and remove large numbers of files on a regular basis, you may want to run Speed Disk more frequently.

8 Be careful with public domain software.
Although there is a lot of good public domain software, it is difficult to sort the good from the bad. Only use public domain software if it has come from a reputable source and you have virus-protection software installed.

9 Use virus-protection software such as Symantec AntiVirus for Macintosh.
A virus can attach itself to an executable (program) file only, so if you don't have virus protection software, beware of sharing programs.

10 Use FileSaver.
Although this won't prevent problems from occurring, you can protect data from being unrecoverable by installing FileSaver. You should update FileSaver information and create new Volume Information Files whenever you make major changes to your volumes.

Error Messages

The following is a list of error messages you may encounter during the course of normal operation. This list is not meant to be a complete error message listing. It is meant to provide help understanding common errors and messages. Some of the conditions which cause errors to occur can be easily corrected using Norton Utilities. Others may be corrected or avoided by reading and following the recommendations that accompany the errors in this listing. If you are not sure about the error message you are getting or if you are getting errors that do not appear in this listing you may contact Technical Support for more detailed information. See the Customer Service Plan or the On-line Help for specific telephone numbers.

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Common memory-related errors

These errors frequently occur when a Macintosh is nearing its memory capacity. If you are getting messages like the ones listed below, it may be time to add more internal memory (RAM).

- **Out of memory**
- **Not enough memory**
- **Memory full. Unable to open file, or**
- **Warning, low on memory, save your work and close any unneeded windows.**
  You were using or opening an application, saving a file, or printing when you got an out of memory message. The application was unable to complete the task because there was no more memory available. If you are using MultiFinder or System 7, try the short-term solution of giving the application more memory: Select the application's icon in the Finder, choose Get Info from the File menu, and type a higher number in the Current Memory Size text box.

Adding RAM to your Macintosh will eliminate (or at least minimize) these types of error messages as well as improve overall software and hardware performance.

Common disk-related errors

Most of the disk errors in this category are common and can happen in any application. Fortunately, most of them can be avoided.

- **The disk is out of space.**
  The disk you were using was full at the time you received this error message. If the disk was a floppy, locate a blank disk and try again.

  If the disk you were using is your hard disk, you might try eliminating files you no longer need (be sure that FileSaver is activated for this drive just in case). If you need most everything on the disk, it might be time to add another hard disk to your Macintosh.

- **Bad sector found.**
  A bad or weak sector was found on your disk. Locate this symptom in Chapter 1.
- **File is locked.**
  The file you are trying to access is locked. Try selecting the file and then choosing Get Info from the File menu in the Finder. See if the Locked checkbox is selected; click to deselect it.
- **Disk (or Volume) is locked.**
  The volume you are trying to access is locked. Try selecting the volume and then choosing Get Info from the File menu in the Finder to deselect the lock checkbox. If the volume is a floppy, the write protect tab may be set in the lock position.
- **File is busy or already open.**
  If you are using MultiFinder or System 7, the file you are trying to open may already be open in another application. Otherwise, it may be possible that you are trying to open a file which is used by the System or Finder.

Errors: Norton Utilities

Directory Assistance II

- **Directory Assistance is very low on memory.**
  If you get this message while running under MultiFinder or System 7, try closing an application you might not currently be using.
- **The file could not be added.**
  It might be that your Directory Assistance preferences file is damaged. The preference files are located in the System Folder. Throw the Directory Assistance II preference file away. Directory Assistance will create a new one for you.
- **The selected file could not be located.**
  The file could not be located because it might not be on any mounted volume or it might have been erased. If you have an unmounted partition, try mounting it.

- **The folder could not be added.**
  It might be that your Directory Assistance preferences file is damaged. The preference files are located in the System Folder. Throw the Directory Assistance II preference file away. Directory Assistance will create a new one for you.

- **The selected folder could not be found.**
  The folder could not be located because it might not be on any mounted volume or it might have been thrown away.

- **The folder could not be created.**
  The volume may be locked, or if you are on a network, you may not have proper access privileges .

- **That file could not be deleted.**
  The file you are trying to delete may be locked. Unlock the file and try again.

- **Directory Assistance is having trouble opening your preference file. (The startup disk may be locked or full) Several features will be disabled.**
  As the message suggests, check to see if the startup disk is locked or full. It might also be that your Directory Assistance preferences file is damaged. See next error message.

- **The custom settings for Directory Assistance II could not be saved.**
  Throw away the file "Directory Assistance II Preferences." You can find it in the System Folder on the Startup volume, within a folder named Preferences, in the Norton Utilities Preferences Folder.

Throwing away your Directory Assistance Preferences file will delete any custom settings and worksets.

- **There is not enough memory to do that.**
  The current operation could not be completed because there wasn't enough memory. If you get this message while running under MultiFinder or System 7, try closing an application you might not currently be using.

- **The alias could not be opened because the original could not be found.**
  The original could not be found because it may not be on a current mounted volume or it may have been thrown away.

FileSaver

- **There's not enough room on the disk to save the current settings.**
  The FileSaver settings that you've selected for the current volume will not be saved because you are out of disk space. Try selecting another volume.
- **Your settings have been saved, but consider running Speed Disk sometime soon on this disk. It's fragmented enough to affect many applications including Finder and FileSaver.**
  Your disk is fragmented. This problem can be solved by first running Norton Disk Doctor to diagnose your disk then Speed Disk to defragment it.
- **Error accessing the FileSaver data file.**
  The FileSaver data file tracks items that have been thrown away. The file is probably damaged and needs to be replaced. Open FileSaver and re-activate protection for the volume with the damaged file.
- **The FileSaver data file is out of date. Use the FileSaver control panel to update the FileSaver data files on your drive.**
  You have not updated your FileSaver files for this volume. Open FileSaver and update protection for the volume with the out-of-date file.

Floppier

- **The destination disk is not the same size as the source image.**
  The destination disk is smaller than the source image file or you have not selected the correct disk size from the pop-up menu.

- **The destination disk is locked.**
  The disk to which you are trying to copy is locked or write protected. Eject the disk and set the tab so that the disk is no longer locked.

- **The destination disk is defective.**
  The disk to which you are trying to copy may be damaged. Eject the damaged disk and try another. You may try the Format layer of Floppier to reformat the defective disk.

- **The destination disk is a high density 1.44 floppy formatted as a 400/800K disk.**
  When this error message appears, it is likely that a high density disk has been formatted to a smaller size. For an immediate workaround, try ejecting the destination disk and covering the hole that identifies it as a high density disk (not the write protect tab) with some tape. This is not a long term solution—you should copy the disk to another that has been formatted correctly.

- **There is not enough space on the destination disk to save this image file.**
  An image files is created as a mirror image of a floppy disk. This error can occur when the image file may be that of an 800K disk when the current destination disk may only be 400K. Solution: Eject the incorrect disk and insert one that is the correct size.

- **Format Failed**
  During the low-level formatting process, some damage or too many errors were encountered. Try formatting a different disk.

- **Verify Failed**
  While a disk is being formatted, each disk block is verified to ensure that it can be located, read and written to. When you get this message, too many blocks on your floppy disk failed the verification process. Try a formatting different disk.

- **Initialization Failed**
  The floppy disk failed the initialization process. The initialization process, among other duties, creates the critical directory structures on a new disk. Try formatting different disk.

- **Floppier cannot copy MFS disks.**
  Floppier does not support MFS disks. However, 400K disks that were created using HFS are supported.

- **You've inserted a different source disk from the one you started with Please try again.**
  During a copy session, a disk other than the source disk was inserted. Find and insert he selected source disk.

Norton Backup

- **Can't write to "disk title"; advancing to disk "disk title".**
  Displayed during an Update backup type when Norton Backup has trouble writing to a floppy disk that it has previously written to. The information on the floppy disk is still valid, but Norton Backup will not add any more information to it.

- **Can't write to "disk title"; try a new diskette.**
  Displayed during a backup when Norton Backup has trouble writing to a floppy disk that it has not yet written to. You should discard the floppy disk and try another.

- **Can't read the hard disk "disk name".**
  Displayed when Norton Backup is able to open the file successfully but cannot read it. The disk may be damaged; run Norton Disk Doctor to diagnose and repair it.

- **Can't create new directory.**
  Displayed during a restore when your permission settings are set to read only.

- **Can't create the file "filename".**
  Displayed during a restore when the permission settings won't allow access to the file.

- **Can't get information about the file "filename".**
  Displayed during a verify when the permission settings won't allow access to the file, and sometimes when the file system is corrupt on the hard disk. Run Norton Disk Doctor to diagnose the disk.

- **Can't open the file "filename".**
  Displayed during a verify when a file is located on the source volume but Norton Backup cannot open it.

- **The Finder information for the file "filename" has changed.**
  Displayed during a verify when the catalog information for a file such as type or creator is different from the information contained in the backup set.

Norton Disk Doctor

- **This is not a bootable disk.**
  If the volume you are currently diagnosing is a startup disk, you should choose to fix this problem. If it is not a startup disk ignore the message and continue the diagnosis.
- **The Volume Bit Map is incorrect.**
  If the Volume Bit Map is incorrect, then some data on the disk may not be properly accounted for. If you get this message you should choose to fix this problem.
- **NDD cannot allocate enough memory to work with this disk.**
  This message can appear when the Disk Doctor is attempting to allocate memory for its diagnosis, but finds that it needs more memory than is currently available. If you are running under MultiFinder, try running under the Finder or using the Emergency Disk. If you continue to get this message, contact Symantec Technical Support for assistance.
- **Can't read Catalog BTree Header.**
  The main data directory on a Macintosh disk is the Catalog Directory. The first sector of this directory is the header node. It provides a map to the rest of the data in the directory. If you encounter this error, try recovering your data using Volume Recover or call Symantec Technical Support.
- **Lots of fLink errors were found.**
  The main directory on a Macintosh disk consists of node that contain file information and links that form a path the Mac follows to locate data in the directory. If you encounter this error, try recovering your data using Volume Recover or call Symantec Technical Support.

- **Extents tree error**
  As a result of day-to-day operations such as saving, deleting, and modifying files, disk storage becomes fragmented. The directory which keeps track of these pieces for especially fragmented files is the Extents tree. An extents tree error can cause files to be read improperly and can be the source of other directory problems as well. If you encounter this message while diagnosing a disk, you should choose to fix the problem.

- **Your disk may be infected with a virus.**
  Disk Doctor can detect the presence of some common Macintosh viruses but cannot eliminate them. If one is detected, you will see this message. To completely eliminate viruses from your system, obtain a software package specifically designed for virus detection and eradication, such as Symantec Antivirus for Macintosh.

- **Some files on this disk are cross-linked.**
  Each block or sector on the disk can only belong to one file at a time. When two (or more) files are cross-linked, their directory entries indicate that they have blocks in common. One or more of the files may already be damaged. You should locate the most recent backup copies of these files, throw the cross-linked files away, and replace them with the backup copies.

- **The root folder could not be found.**
  The main directory on a Macintosh disk has a structure somewhat like a tree. It begins at at a single place and branches into sub-regions. The root of the directory is the single place where all branches of the directory begin. If the root is unreadable, the directory will not be able to locate any files on your disk. If this error message appears, you should choose to fix the problem. If Disk Doctor reports that the problem cannot be fixed, try recovering your data using Volume Recover.

Norton Installer

- **Existing file was locked.**
  A file that needs to be removed or relocated is locked. Quit the Installer, unlock the file and try again.

- **Diskette is write protected.**
  You may be trying to install files onto a locked disk. Eject the disk, set the write protect tab to the unlocked position and continue.

- **An error occurred while installing the (system enhancement/desk accessory/application) into the (System file/suitcase file/folder) on (diskname).**
  A System error occurred during installation of Norton Utilities. Call Symantec Technical Support.

- **There was not any room in the (System file/suitcase file/folder).**
  There is insufficient space on the disk to install Norton Utilities' Desk Accessories.

Volume Recover

- **Can't restore the boot drive.**
  You've attempted to restore the current startup drive to the startup drive. A startup drive has files such as the System and Finder which are open and cannot be replaced. Restore the drive to another volume.

- **Error mounting this disk, recovery may have not been successful. The FileSaver data file may have been damaged. Try running Norton Disk Doctor to fix the problem.**
  After recovering, Volume Recover could not successfully mount the disk to the desktop. This indicates there may still be problems. Use Disk Doctor to attempt further repairs.

UnErase

- **FileSaver protection was not enabled for this disk, so no files could be found to UnErase.**
  You may not have installed FileSaver protection on the current disk. Use another UnErase recovery method.

- **Ran out of memory while trying to UnErase.**
  The UnErase operation you just attempted required more memory when none was available. In the Finder, close all unneeded windows. In MultiFinder, try giving

the Norton Utilities application more memory by adjusting its size using the Finder's Get Info command. (See "Common memory errors" at the beginning of this Appendix.)

Norton Disk Editor

- **Sorry can't edit messages.**
  You can not use Norton Disk Editor to edit MFS disks or file servers.

- **Warning: that file is too fragmented to search. Run Speed Disk to defragment your disk.**
  You've attempted to edit a file that is spread out across the disk in too many pieces. The Disk Editor does not have enough memory to manage all the pieces adequately. Run Speed Disk to defragment your disk and files.

Norton Utilities Help

You may get these messages from while in Help for any Norton Utilities application.

- **Help failed to initialize.**
  The help file is probably damaged. Replace the damaged file with a copy from your original set of Norton Utilities disks.

- **The 'help' resource is missing.**
  The Norton Application cannot find the Norton Help file. Replace the application and the help file with a copy from your original set of Norton Utilities disks.

- **Help is in use by another application.**
  This message is displayed if you are on a network where one copy of Help is shared, or running more than one copy of the Norton Utilities with only one Help file.

- **The Help file is locked.**
  The Help file is locked, or the disk it is currently on is locked. Unlock the Help file or its disk to enable its use.

- **You do not have access privileges to the Help file.**
  If you are on a network, your access privileges to this file are inhibited. Change the privileges to utilize the Norton Help.

Speed Disk

- **An unknown error (xx:yy) has occurred.**
  Speed disk has run into a serious problem while optimizing the disk. Write down the numbers (xx:yy) and contact Symantec Technical Support.

- **There is not enough memory for Speed Disk to continue.**
  File allocation on this disk is confused. Optimization cancelled.

- **The size of this disk's directory is incorrect, Optimization cancelled.**
  There is a discrepancy in the directory's header (sort of like a Table of Contents). Please contact Technical Support. This can also be cleared up by faxing the Extents Tree Header's hex view.

- **There is a problem with the Speed Disk preference file.**
  Throw away the file "Speed Disk Preferences." You can find it in the System Folder on the Startup volume,within a folder named Preferences, in the Norton Utilities Preferences Folder.

- **The extents directory on this disk contains an invalid node - node (#)**
  Please make note of the node number and the rest of the error message. This message indicates that the information for fragmented files on the disk is incorrect. Technical Support can assist you in putting everything in the proper order.

- **This is your startup disk. To optimize this disk. restart your Macintosh using the Norton Applications Disk 1.**
  To completely optimize your disk, Speed Disk requires that there be no open files. Since your start-up disk always has the System file open, it is necessary to start from another disk. Refer to Chapter 5, "Optimizing a Disk" for more information.

- **The files listed below are cross-linked (they share the same blocks on the disk). Because its uncertain which ones 'really' own the blocks in question, you should back them up and throw them away immediately.**
  Each block or sector on the disk can only belong to one file at a time. When two (or more) files are cross-linked, their directory entries are indicating that they have blocks in common. One or more of the files may already be damaged. You should locate the most recent backup copies of these files you might have, throw the cross-linked files away replacing them with the backed of copies.

- **The files below could not be defragmented. To optimize these files, restart your Macintosh using the Norton Applications Disk 1.**
  Speed Disk can not defragment open files. To gain the maximum benefit from Speed Disk, we recommend that you start your Macintosh with the appropriate disk for your Mac. See the chart above.

- **This Disk contains defective sectors and may not be optimized.**
  Speed Disk will list any files that contain defective sectors and allow you to mask defective sectors so that they will not be used. However, this should only be used as a temporary measure. The best solution is to backup your hard disk, and run the formatting software that was supplied with your drive. Most formatters will lock out bad sectors so that they are not seen by the Finder at all. This is a longer term solution.

- **This disk has a weak sector. It's not completely defective yet, but might soon be. Your files are still safe, but you should reformat this disk to prevent any future problems.**
  Your disk's sectors and the data on those sectors is in danger of becoming damaged. If this problem is not corrected immediately, you could lose data. The best solution is to backup your hard disk, and run the formatting software that was supplied with your drive. Most formatters will check the surface of the disk and

lock out bad or weak sectors so that they are not seen by the Finder at all.

- **Speed Disk cannot optimize remote drives.**
  You will need to optimize all disks from the Macintosh to which the drive is connected. Speed Disk will run much more quickly from the local Macintosh.
- **Sorry, Speed Disk cannot optimize MultiDisk™ partitions.**
  Speed Disk will only work on HFS disks or soft partitions created by Norton Partition or similar soft partition.
- **There seems to be something wrong with this disk. Run NDD to determine the problem.**
  Run Norton Disk Doctor on the disk you are attempting to optimize. If Norton Disk Doctor is unsuccessful, contact Technical Support to have this problem diagnosed.
- **FileShare is on. You need to turn it off before you can optimize this volume.**
  If you are running System 7, you will need to turn off FileShare. Refer to your System 7 documentation for directions. Or start your Macintosh from the correct Norton Utilities disk to optimize (see chart above). This will turn off FileShare temporarily.

Wipe Info

Wipe Info has a few necessary requirements. The list of items below are messages rather than errors and can be avoided when using Wipe Info.

- **This disk contains files that are in use. You must close all open files and applications on this disk (or turn off FileShare) before it can be wiped.**
- **That file can't be wiped because it is busy or in use.**
- **The volume "volume name" is currently locked and can't be wiped.**
- **You do not have the proper access privileges to wipe that file.**

When you choose to wipe a disk, folder or file, there are a few rules. Wipe Info will not allow you to wipe:

- The current startup disk
- Open applications or files
- Shared files folders or disks
- Locked files folders or volumes
- Other AppleShare privileged folders or volumes

APPENDIX

D Guide for the Network Administrator

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Norton Partition for the Network Administrator

Norton Partition provides some special features for network administrators through the Advanced Options dialog box. These features are not otherwise available.

This appendix tells network administrators how to set up and maintain partitions for public and private access. Other features of partition are descibed in detail in Chapter 4, "Customizing a Disk," Chapter 6, "Creating a Secure Partition," and in the Norton Partition Reference section of this manual.

This section assumes the following:

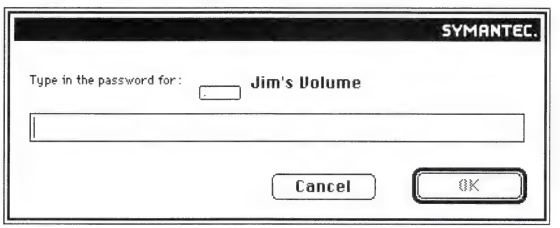
- You understand the Norton Partition Reference section of this manual
- You are a network or system administrator
- Norton Partition is open and active on the desktop.

Accessing the Advanced Options dialog box

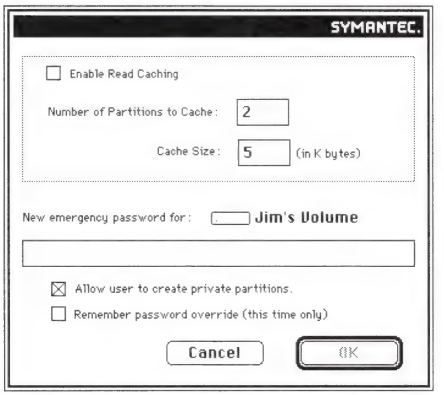
The Advanced Options settings allow access to all encrypted partitions on a given parent volume which were created with the emergency access option selected.

1 Choose Advanced Options from the Partition menu.

A dialog box appears where you're asked for a password.



2 Type "password" then press return.
The Advanced Options dialog box appears.


SYMANTEC.
Enable Read Caching
Number of Partitions to Cache: 2
Cache Size: 5 (in K bytes)
New emergency password for: Jim's Volume
Allow user to create private partitions.
Remember password override (this time only)
Cancel
OK

› **To change the default emergency password**

1 Click in the text box next to New Emergency Password and type a new password.

2 Click OK.
You return to the Partition window.

The next time you select Advanced Options from the Partition menu, you'll use the new password. Be sure to remember it!

Private Partition Access

By default, users may create private partitions. A private partition is one that is only accessable by entering in the password assigned to it when it was created. This ability can be restricted by changing the default Advanced Options settings.

Method 1 Allowing user created partitions with emergency access

Users can restrict your access by leaving the Emergency access checkbox unchecked when creating new partitions. This is not always advised, unless security is mandated. If a user forgets his/her password to a private partition and the partition was encrypted, the data contained on the partition will never be accessable again. If the user checks the Emergency Access checkbox when creating a partition, you may use the password override feature to gain access to the partition.

To allow private partitions with emergency access, inform your users to always check the Emergency Access checkbox when creating a new partition. If a partition is encrypted using the settings dialog at a time other than creation, emergency access cannot be enabled.

As a network administrator, you can gain access to such a partition without the private password by doing the following.

› **To bypass private password protection on a partition:**

1 In the Advanced Options dialog box, select the "Remember password override" checkbox.

2 Click the Close box and you will return to the Norton Partition main window.
You may now mount any partition that had its Emergency Access checkbox selected at creation.

Method 2 Disallowing private partition creation

As the network administrator, you have the ability to eliminate private password abilities.

1 From the Partition menu, select Advanced Options.
Click the checkbox to select it. A dialog box appears where you are asked to enter a password.

2 Enter your password then press return.
The Advanced Options dialog box appears.

3 Locate the "Allow user to create private partitions" checkbox.
While this option is checked, users may create partitions that can only be accessed with their private passwords by leaving the Emergency Access checkbox in the New Partition dialog box unchecked. You will not be able to access those partitions unless you know the passwords.

4 Deselect the "Allow users to create private partitions" option.

5 Click the close box.
You return to the Norton Partition window.

6 Click the New button.
The New Partition dialog box appears.

Set and disabled Emergency Access option

Note that the Emergency Access checkbox option is dimmed in the New Patition dialog box. Users can still encrypt and password protect partitions, but you will now have access to these partitions without private passwords.

Norton Partition setup and distribution

For security purposes, Norton Partition stores the above changes within itself. This means that once changes have been made, a copy of your configured Norton Partition desk accessory need to distributed to each partition user on the network. The following methods can be used to accomplish this task:

- Copy the configured Norton Partition DA to a floppy disk to distribute for manual installation.
- Copy the Norton Utilities for Macintosh Installer disk, and the Applications Disk 3 (making sure the modified Norton Partition DA replaces the original). Distribute the two disks, informing users to do a custom install.

Norton Backup Guide for the Network Administrator

Norton Backup can be used by the network administrator to backup servers and shared volumes. This section describes special backup considerations for AppleShare, AppleShare compatible and FileShare networking environments as well as helpful tips and suggestions for the network administrator.

We assume the following:

- You have read and understand the documentation provided with your networking environment
- You have read and understand the Norton Backup Reference section of this manual
- You are a network or system administrator

Summary of Norton Backup Network Features

- Preserves and restores access privileges on folders and volumes
- Supports backup at both the user and administrator levels
- Supports creation of a single backup set from multiple volumes

Display of privileged items in the Norton Backup and Restore windows

Users may back up any folders for which they have privileges but will see restricted items displayed within the Norton Backup file list in two ways:

- A folder that a user does not have access privileges to will be displayed with a strap or belt vertically encompassing the folder.
- A folder for which a user has partial access privileges for (a folder which contains other users' protected files) will be displayed with a key icon superimposed on it.

AppleShare considerations

As the administrator, you can gain access to all privileged files on an AppleShare server. In this way it is possible to make a complete backup of the documents and volumes using Norton Backup. There are however a few things that need to be considered beforehand.

Users and Groups file backup

The Users and Groups file must be backed up separately using the AppleShare Administrator feature in the AppleShare server software.

See the AppleShare File Server Administrator's Guide for complete details on backing up the Users and Groups file.

Complete server backup

This procedure backs up all volumes, folders and files except the Server Folder and the Users and Groups file. We suggest you back up to a Macintosh file on another large volume.

1. **Log on at a workstation as the administrator with the All Privileges option selected in the user information window of your AppleShare software and mount all AppleShare Volumes on your server.**
2. **Launch Norton Backup**
3. **Select the type of backup you wish to perform, setting desired options.**
4. **Select all of the contents of the server volumes making sure that the overall size of the selected items does not exceed the free space on your destination volume.**
5. **Click the Start Backup button.**

System 7: FileShare considerations

Creating and restoring backup sets in a FileShare environment is quite easy. We present the following procedures as special considerations involving a backup set which includes a server's System Folder. Although this is not a typical backup scenario, it is one way to prevent losing privileges in case of a crash.

Complete server backup

Under System 7, all shared volumes including the System Folder and the Users and Groups file can easily be backed up at any sharing workstation. To perform a complete backup, be sure of the following things first:

- Be sure File Sharing is on and all shared volumes are mounted.
- Be sure privileges are currently set enabling full access to all privileged folders.
- Make sure that the user and group names are active. Otherwise, just the privileges will be backed up.
- Make sure the Users and Groups file is selected as part of the backup.
- See steps 2 through 5 under AppleShare Considerations

Restore

This procedure assumes that you are restoring an entire server including the System Folder to an empty drive.

› **To restore a server that included the server's System Folder as a part of the backup set:**

1. **Launch Norton Backup double clicking on the backup information file.**
2. **Click the dog-ear to the Restore layer and select the destination for the restored backup set.**
3. **Select and restore the System Folder (containing the Users and Groups file) FIRST.**

4 **Exit Norton Backup and Open the recently restored System Folder on the server and then close it. This procedure "blesses" the System making the server a startup volume.**

5 **Boot the restored server and Start FileSharing. See Macintosh User's Guide if you need help locating this feature.**

6 **Launch Norton Backup again, using the backup information file.**

7 **Select and restore everything except the System Folder.**

Glossary

Most of the terms in this glossary relate specifically to Norton Utilities for Macintosh. Some of the terms were adapted from the Apple Publication Glossary (© 1988–1991 by Apple Computer, Inc.) and from the Macintosh Reference (©1991, by Apple Computer, Inc.)

For definitions of general operating terms related to Macintosh system software, see the manual that came with your Macintosh.

alert box A box that appears on the screen to give a warning or error message. Its appearance is sometimes accompanied by an alert sound.

alias (System 7) A representative of the original of a document, folder, program, or disk that you can use as if it were the original. When you double-click the icon of an alias, the alias locates the original, and the original opens. The name of an alias appears in italics.

Application menu (System 7) The menu at the right end of the menu bar that shows which application programs are open. It also has commands for hiding and showing open windows.

application program A program that performs a specific task, such as word processing, database management, or graphics. Also called an application.

ASCII Acronym for *American Standard Code for Information Interchange* (pronounced "ASK-ee"). A standard that assigns a unique binary number to each text character and control character. ASCII code is used for representing text inside a computer and for transmitting text between computers or between a computer and a peripheral device.

Ask Before Overwriting (Norton Backup) A backup option that causes you to confirm a choice before overwriting (destroying) data on a floppy disk.

Ask Before Replacing Files (Norton Backup) A restore option that causes you to confirm a choice before replacing pre-existing files during a restore.

attribute See **file attributes** and **volume attributes**.

background A relatively inconspicuous place. A program operates "in the background" if it continues to function automatically while you use another program.

Backup (Norton Backup) The Norton Backup process that copies files from a hard disk to another medium, such as floppy disks, for safe-keeping or other purposes.

Backup Cycle (Norton Backup) A cycle that begins with a complete backup of a set of files and includes all partial backups of the same set of files. The next complete backup of that same set of files begins a new cycle. Your backup cycle may be daily, weekly, monthly, or some other period of time, and should be based on your work habits and backup requirements.

Backup Description File (Norton Backup) Files that contain the option settings, file selections, scheduled events, and the catalog. Backup information files can be stored in any folder on any mounted volume, although the normal location is the Norton Utilities Folder.

Backup Media (Norton Backup) The storage material on which information is stored; for example, floppy disks.

Backup Set (Norton Backup) The set of floppy disks containing a copy of your backed-up information and the catalog.

backup A copy of a disk or of a file on a disk or elsewhere. It's a good idea to make backups of all your important disks and to use the copies for everyday work, keeping the originals in a safe place.

bad sector An area of a disk that is unreadable. Bad sectors can be caused by **physical** problems (for example, scratches or fingerprints) or **logical** problems. Speed Disk can locate bad sectors on your hard disk and render them harmless.

block (1) A unit of data storage or transfer, typically 512 bytes. (2) A contiguous, region of computer memory of arbitrary size, used by an application to store data. Also called a *memory block*.

boot Another way to say *start up*. A computer boots by loading a program into memory from an external storage medium such as a disk. Starting up is often accomplished by first loading a small program, which then reads a larger program into memory. The program is said to "pull itself up by its own bootstraps"—hence the term *bootstrapping* or *booting*.

boot block (1) An area on a formatted disk that signals the computer that the disk contains an application to be started up. (2) The first block of a file system, or the first two logical blocks of a volume. The boot block contains the system's startup instructions, filing system identification, names of system files, maximum number of files that can be open at one, bootstrap code, and other vital information.

boot device The peripheral device that reads an operating system's initial startup instructions.

boot disk See **startup disk.**

bundle A resource that links files with their appropriate icons so that the Finder can correctly launch applications and open files.

button A pushbutton-like image in dialog boxes where you click to designate, confirm, or cancel an action.

byte A unit of information consisting of a fixed number of **bits.** One byte consists of a series of eight bits and can take any value between 0 and 255 ($00 and $FF hexadecimal). The value can represent an instruction, number, character, or logical state. See also, **kilobyte, megabyte.**

cache A holding area in main memory where write information for block input/output is temporarily stored.

case-sensitive Able to distinguish between uppercase characters and lowercase characters. A Find command is case-sensitive, for example, if typing and produces different results from typing AND in a text box.

catalog b-tree A data structure that contains essential bookkeeping information for an HFS disk, including the physical locations, names, and sizes of files and folders. It also contains data about the data and resource forks of files.

CDEV Short for control panel device. *See* Control panel

central processing unit (CPU) The "brain" of your computer; the microprocessor that performs the actual computations.

character code An integer representing the character that a key or key combination stands for.

Compress (Norton Backup) A backup option that allows Norton Backup to analyze the files being backed up and collapse the repetitious portions into an efficient, space-saving format. Compression reduces the amount of backup media required.

Control Panel(s) A desk accessory that lets you change the speaker volume, the keyboard repeat speed and delay, mouse tracking, color display, and other features. Control panel(s) are located inside the System Folder (System 7).

control character A nonprinting character that controls or modifies the way information is printed or displayed.

control key See **modifier key.**

"crash" To cease to operate expectedly, possibly destroying information in the process.

"crashed" drive A drive that won't mount, or appear, on the desktop.

creator code See **file creator code**.

current startup disk The disk that contains the system files the computer is currently using. The startup disk icon always appears in the upper-right corner of the Finder's desktop.

data fork The part of a file that contains data, accessed via the File Manager.

decimal system The commonly used form of number representation, in which numbers are expressed in the base-10 system, using the ten digits 0 through 9. Compare **hexadecimal system.**

DES Data Encryption Standard. An algorithm commonly used for encryption, developed and maintained by the U.S. National Bureau of Standards. Norton Encrypt can use DES to encrypt data.

desk accessory A small application program that provide useful additions to your system. Desk accessories include the Alarm Clock, Calculator, and so on. You place these into the Apple Menu Items folder in System 7, or into the system using Font/DA mover in System 6*.x*, if you immediate access to them from the Apple menu.

Desktop file A resource file in which the Finder stores the version data, bundle, icons, and Get Info comments for each application on the volume.

desktop Your working environment on the computer—the menu bar and the background area on the screen. You can have a number of documents on the desktop at the same time.

destination volume The duplicate volume, as opposed to the source (original) volume. When you are making a copy of a file or a volume, the destination volume is the volume onto which you are copying. Compare **source volume.** See also, **volume.**

device A peripheral piece of equipment attached to your Macintosh.

device driver See **driver**.

directory (1) A file used internally by the Finder and other parts of the operating system that contains a list of all the names and locations of other files stored on a disk. (2) A list of the contents of a folder or a disk.

directory dialog box A type of dialog box you use to work in the hierarchical file system from within an application. Such dialog boxes appear whenever you choose the Open or Save As commands from within an application.

directory hierarchy The collection of all files on the currently mounted file systems. Hierarchy refers to the logical structuring of files within folders.

disk A flat, circular, magnetic surface, serving as a medium for storing information.

disk drive The device that holds a disk, retrieves information from it, and saves information to it.

disk drive light A light that comes on when your disk drive is loading from or storing on a disk.

dog-ear Same as page corner. A triangular-shaped button like the turned-down corner of a page.

drive (1) See **disk drive.** (2) A button in certain dialog boxes that allows you to access information from a different drive (volume).

driver A system program that manages the transfer of information between the computer and a peripheral device. For example, the SCSI device driver is the program code stored in the boot blocks of a disk that manages communication between an application and data on the SCSI device. Drivers are represented by icons which you normally drag to your System Folder to install then you restart your Macintosh. Also called *device driver* or *resource.*

encryption The process of scrambling data to prevent its unauthorized use, usually based on a key, or password. See also **DES**.

Error Correction Codes (Norton Backup) A special error correction system that writes identifying data onto the backup floppy disks. If a backup floppy disk is damaged after a backup set is made, the error correction codes can be used to help recover the information.

extents b-tree A data structure containing records of fragmented files where they begin, where each fragment is stored, and how large each fragment is.

field A data item separated from other data by blanks, tabs, or other specific delimiters.

file Any named, ordered collection of information stored on a disk. Application programs and documents you create are examples of files. A Macintosh file consists of a **data fork** and a **resource fork.**

file attributes Information indicating whether a file is locked, invisible, and so on.

file creator code A 4-digit sequence contained in a file that specifies which application created it. Compare with **file type**.

file server A computer with special software that allows a large number of network users to store and retrieve files from the storage devices attached to it. For example, AppleShare software, Macintosh computers, and one or more hard disks make up a file server on an AppleTalk network (a LAN, or Local Area Network) system.

file system Part of the operating system that manages how files and folders are organized and retrieved.

file type (1) In a directory listing, the code that characterizes the contents of a file and indicates how the file may be used. (2) A four-character sequence, specified when a file is created, that identifies the type of file. Examples of file types are TEXT, APPL, and MPST. Compare with **file creator code**.

filename The name that identifies a file. The maximum character length of a Macintosh filename is typically 31 characters. Compare **pathname.**

Finder The application that maintains the Macintosh desktop and starts up other programs at the request of the user.

floppy disk A disk made of flexible plastic that stores computer data. The disks used in Macintosh disk drives are floppy disks housed in rigid plastic containers.

font A collection of letters, numbers, punctuation marks, and other typographical symbols with a name and consistent appearance.

fork One of the two parts of a Macintosh file, the *data fork* contains data accessed via the Macintosh File Manager, and the *resource fork* contains data used by the application, such as menus, fonts, and icons.

format To divide a disk into tracks and sectors where information can be stored. Blank disks must be formatted before you can save information on them for the first time. Formatting can be *low-level*, in which brand-new hard disks (or floppies, whether brand-new or not) are made ready to store data, or *high-level*, where a directory is created (or

destroyed, in the case of accidentally formatting a data-containing hard disk) by system software. Format Recover used together with FileSaver provides a remedy for the latter case. Often referred to as *initialize*.

fragmented In several pieces. Memory or disk space can be fragmented. Speed Disk eliminates disk fragmentation when it optimizes a volume.

free space The portion of memory or of a disk that is not allocated to (used by) any file.

"happy Macintosh" An icon displayed when a valid system folder is found on a valid volume during startup. Compare with "**sad Macintosh**."

hard disk A disk made of metal and permanently sealed into a drive or cartridge. A hard disk stores large amounts of information and operates much faster than a floppy disk.

hard disk drive A device that holds a hard disk, retrieves information from it, and saves information to it. Hard disks made for microprocessors are permanently sealed into the drives.

hexadecimal system The representation of numbers in the base-16 system, using the ten digits 0 through 9 and the six letters A through F. For example, the decimal numbers 0, 1, 2, 3, 4, . . . 8, 9, 10, 11, . . . 15, 16, 17 would be shown in hexadecimal notation as 00, 01, 02, 03, 04, . . . 08, 09, 0A, 0B, . . . 0F, 10, 11. Hexadecimal numbers are a convenient representation of the computer's internal memory organization. Hexadecimal numbers are usually preceded by a dollar sign ($).

hierarchical file system (HFS) A feature of system software that lets you use folders to organize documents, applications, and other folders on a disk. Folders (sometimes called subdirectories) can be nested in other folders to create as many levels as you need.

high-density disk A floppy disk that can store 1.4 MB of information. High-density disks can be used only with the SuperDrive floppy disk drive.

hyperlink A connection between related items in databases. The Norton Utilities for the Macintosh has an on-line help system that allows users to click on specially marked text to access hyperlinks in order to see material about related concepts.

information window The window that appears when you select an icon and choose Get Info from the File menu. It supplies information such as size, type, and date, and it includes a comment box for adding information.

INIT An acronym for intialization resource. A special program that you put in your System folder and that loads into the Macintosh's RAM during every startup procedure. When you restart your Macintosh it becomes active. Memory-resident anti-virus software such as SAM Intercept (Symantec AntiVirus for Macintosh) is a combination of an INIT and CDEV (control panel device). *See* Control panel.

initialize To prepare a disk to receive information by organizing its surface into tracks and sectors. See also **format**.

initialized disk A disk that has been organized into tracks and sectors by the computer and is therefore ready to store information.

installation The process of copying files from floppy distribution diskettes to a hard disk and setting appropriate configuration information.

installer A program that install or updates software and lets you add additional resources such as networking capabilities.

K See **kilobyte.**

kilobyte (K) A unit of measurement consisting of 1024 (2^{10}) bytes. Thus, 64K memory equals 65,536 bytes. The abbreviation *K* can also stand for the number 1024, in which case *Kbyte* is used for kilobyte. See also **megabyte.**

layer A collection of related controls, such as buttons, pop-up menus, and icons, that enable you to perform one task or related group of tasks in an application.

local area network (LAN) A group of computers connected for the purpose of sharing resources. The computers on a local area network are typically joined by a single transmission cable and are located within a small "local" area such as a single building or section of a building.

lock To prevent files or disks from being changed or deleted (they can still be opened and copied); in this sense *lock* is synonymous with *write-protect*. Individual files are locked using the Get Info command. A floppy disk can be physically locked by sliding the small tab on the back of the plastic case toward the edge of the disk.

locked file — A file whose data cannot be changed.

locked volume — A volume whose data cannot be changed. Volumes can be locked by either a software flag or a hardware setting.

logical — Governed or specified by software. Compare with **physical**.

Macintosh File System (MFS) — A non-hierarchical (single-level) file system that was used on the original Macintosh computer and preceded the currently used HFS (Hierarchical File System). Note: most current formatted 400K single-sided disks use MFS. Unfortunately, the Norton Utilities for the Macintosh only address HFS disk problems. Compare with **Hierarchical File System**.

Media (Norton Backup) — Material or means of storing information; for example, disks. See **Backup Media, bad sector**. More properly, *medium* (sg.), *media* (pl.).

megabyte (MB) — A unit of measurement equal to 1024 kilobytes, or 1,048,576 bytes. See also **kilobyte.**

memory block — A contiguous, page-aligned region of computer memory of arbitrary size, allocated by the Memory Manager. Sometimes simply called a *block*.

mount — To install a file system onto the directory hierarchy. Compare **unmount.**

mounted volume — A volume that has been inserted into a disk drive and has had descriptive information read from it by the File Manager.

MultiFinder (System 6.*x*) — A first-generation multitasking operating system for Macintosh computers that makes it possible to have several applications open at the same time, including background applications that let you perform one task while the computer performs another.

network — A collection of devices, such as computers and printers, connected together. A network is used to store and retrieve information, share printers, and exchange information.

NuBus — An address and data bus incorporated into the Macintosh II family and other Macintosh computers. NuBus lets you add a variety of components to your computer system through expansion cards installed in NuBus expansion slots inside your Macintosh.

on-line help Assistance you can get from an application program while it's running.

optimize To improve the performance of something. Norton Speed Disk, for example, optimizes your hard disk by eliminating fragmentation, making free space contiguous, and by prioritizing files.

overwrite To replace or destroy data (files, disks, and so on).

page corner A triangular-shaped button like the turned-down corner of a page. Also called a dog-ear.

pane An area of an application program's interface that displays one type of information.

panel A section of an application program's interface containing a group of controls such as buttons.

Parameter RAM An area of memory where certain settings and basic functions are stored. Battery-powered, it stores information even after you switch off your Macintosh.

partition A segment of a volume created either by software or by hardware.

password A secret word, phrase, or string of characters that lets only its creator see data or messages or encrypted volumes and folders.

pathname A description of the exact location of a file in a file system.

physical Governed or specified by hardware. Compare with **logical**.

PRAM See **Parameter RAM**.

program disk A disk that contains an operating system and a self-starting application program.

RAM See **random-access memory.**

RAM cache Random-access memory you can designate to store certain information an application uses repeatedly. Using the RAM cache can greatly speed up your work, but may need to be used sparingly or not at all with applications that require large amounts of memory. You set the RAM cache in the Control Panel and in certain other applications.

random-access memory (RAM) The part of the computer's memory that stores information temporarily while you're working on it. A computer with 2MB RAM has 2MB kilobytes of memory available to the user (minus the amount occupied by the

operating system). Information in RAM can be referred to in an arbitrary or random order, hence the term *random-access*. Information in RAM is temporary, gone forever if you switch the power off without saving it on a disk or other storage medium.

reboot See **restart**.

resource fork The part of a file that contains information used by an application, such as menus, fonts, and icons. An executable file's code is also stored in the resource fork. Sometimes called a *resource file*. Compare with **data fork.**

restart To start your computer again, by choosing the Restart command from the Special menu of the Finder. It is necessary to restart when you place new startup documents in your System folder—DiskLight and File Saver, for example—in order to launch them (*mostly* System 6.*x*).

"Sad Macintosh" An icon that indicates a serious problem encountered during startup preventing further progress. Consult the Emergency Procedures section for further information.

SCSI An acronym for *Small Computer System Interface* (pronounced "SKUH-zee"). An industry standard interface that provides high-speed access to peripheral devices.

SCSI device A device, such as a hard disk or tape backup unit, that use the Small Computer System Interface.

sector Part of a **track** on a disk; when a disk is formatted, its recording surface is divided into tracks and sectors.

signature A sequence of bytes contained in the header that uniquely identifies an application or document to the Finder and to data-recovery applications like UnErase. Compare with **file creator code**.

source volume The original volume, as opposed to the duplicate (destination) volume. When you are making a copy of a file or a volume, the source volume is the volume from which you are copying.

startup disk A disk with all the necessary program files—such as the Finder and System files contained in the System Folder for the Macintosh—to set the computer into operation. Sometimes called a *boot disk*. **Startup drive** is the disk drive from which you start your application.

startup document A small program loaded into memory at startup time. Startup documents are located in the System Folder (System 6.*x*) or inside the Startup Items folder inside the System Folder (System 7).

system extension (System 7) A program that expands the capabilities of system software. They include drivers and programs that add features to the Finder or the system software. They are stored in the Extensions folder in the System Folder.

system startup information Certain configurable system parameters that are stored in the first two logical blocks of a volume and read in at system startup. See **boot block**.

text box The place or places in any dialog box where you can type information.

tracks A series of concentric circles that are magnetically drawn on the recording surface of a disk when it is formatted. Tracks are further divided into 8–12 consecutive *sectors*. A track corresponds to one ring of constant radius around the disk.

unlock To remove the restriction on the use of a disk or a file so that it can once again be changed, deleted, or renamed. Compare **lock.**

unmount To remove a file system from the directory hierarchy; to cause a logical volume to disappear from the desktop.

unmounted volume A volume that hasn't been inserted into a disk drive and had descriptive information read from it, or a volume that previously was mounted and has since had the memory used by it released.

virus A program intended to alter data in an invisible fashion, usually for destructive or "mischievous" aims; viruses are often transferred across local area networks, electronic bulletin boards, or by infected (floppy) disks. The Norton Disk Doctor diagnoses certain viruses, and Symantec AntiVirus for the Macintosh (SAM) diagnosis and removes many, many viruses (over 1,000 at this printing).

volume A general term referring to a storage device or to part of a storage medium formatted to contain files; a source of or a destination for information. A volume can be an entire disk or only part of a disk; it's a logical disk, so to speak. Its information is organized into files.

volume attributes Information contained on volumes and in memory indicating whether the volume is locked, whether it's busy (in memory only), and whether the volume control block matches the volume information (in memory only).

volume bit map A portion of every initialized disk that keeps track of every block (logical sector); it records which blocks are occupied and which represent free disk space. Speed Disk displays a graphic depiction of the volume bit map to indicate fragmentation and to show what happens during optimization.

volume information block A nonrelocatable block that contains volume-specific information including the volume name, size, number of files and folders, amount of free space, and so on.

window An area that displays grouped or related information.

write To transfer information from the computer to a destination external to the computer (such as a disk drive, printer, or modem) or from the computer's processor to a destination external to the processor (such as main memory).

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Personal System Information

Symantec Software:

Product Name Version

Serial Number (if applicable)

Hardware:

Computer

Model RAM (random-access memory, in MB)

Operating System Software:

MS-DOS Version

Windows Version

Macintosh System Version

Miscellaneous:
Include manufacturer name, product name, and model number for hardware, if known

Hard Disk Capacity (in MB)

Type: SCSI ESDI RLL MFM IDE Other

Video Board/Monitor

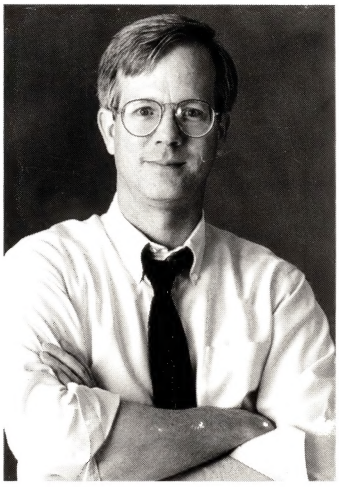
Printer/Plotter

RAM Expansion Board

Modem Speed (in baud)

Other Hardware

TSRs/Device Drivers/Memory Managers/Other Software



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